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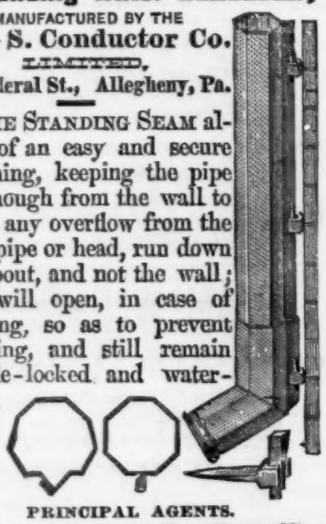

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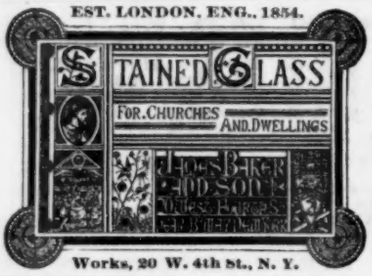

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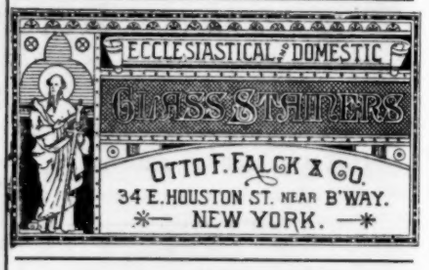

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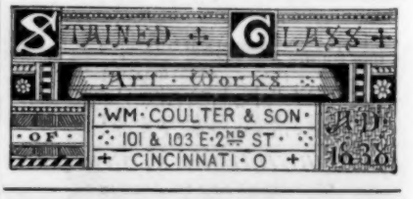

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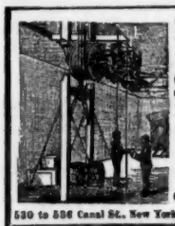

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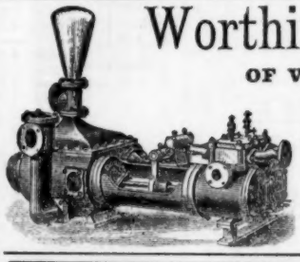

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Net Surplus	832,744.56
Total Assets, January 1, 1883	2,565,141.29

BUILDING MATERIALS.

Reported for the American Architect and Building News.

BRICK.—₱ M.	New York. (Wholesale Prices.)	Boston. (Prices to Builders and Contractors.)	Chicago.	Philadelphia.
Common: *Cargo afloat.*				
Pale	$2 25 @ $3 50	Eastern 7 50 @ 8 00	Building Brick 6 50 @ 7 50	Hard 8 00 @ 8 50
Jersey	4 50 @ 5 00	Bay State Hard 9 00		Salmon 5 00 @ 6 00
Up River	5 00 @ 5 50	Domestic Com. 8 00 @ 9 00	Indiana Pressd 16 00 @ 28 00	Stretchers 11 00 @ 14 00
Haverstraw Bay	5 50 @ 6 25	Domestic Face @ 18 00	St. Louis Fronts 25 00 @ 30 00	Pressed 20 00 @ 24 00
" 1st	6 25 @ 6 50	Philadelphia 40 00 @ 45 00		
Fronts:		Phila. mould 50 00 @ 80 00		
Croton, Brown	13 @ 14 00		22 00 @ 35 00	
" dark	14 @ 15 00		65 00 @ 350 00	
" red	14 @ 15 00		50 00 @	
Chicago pressed				
Chicago Moulded				
Baltimore	37 @ 41 00			
Glens Falls—white	30 @ 35 00	Glens Falls 25 00 @ 26 00		
Philadelphia	@ 27 00		42 00 @	
Trenton	@ 27 00		40 00 @	
Milwaukee		Glens Falls Mould. 30 00 @ 35 00	25 00 @	
Moulded:			60 00 @ 100 00	
Clark's Glens Falls—Red	25 00 @ 27 00		30 @	
" —White	30 00 @ 35 00	35 00 @ 40 00	35 @	
White " Mold	45 00 @ 60 00	45 00 @ 60 00	55 00 @ 65 00	
Enamelled: *Imp.*				
Enamelled (edge.)	85 00 @ 100 00	@	@ 100 00	Dom. @ 70
Enamelled (edge and end)	90 00 @ 115 00	@	@ 125 00	@ 85
CEMENT, LIME, etc.—(₱ *cask.*)				
Chicago Lime in bulk			65 @ 75	
Wisconsin "			80 @ 90	
Rosendale Cement	80 @ 90	@ 1 50	*Not Sold.*	1 25 @ 1 65
Utica, Akron, Buffalo, Louisville, Milwaukee	*Not sold.*	*Not sold.*	1 00 @ 1 25	*Not sold.*
Portland (English)	2 60 @ 3 10	@ 3 20	2 75 @ 3 00	2 30 @ 3 50
" (Saylor's Am.)	2 05 @ 2 40	2 50 @ 3 00	2 75 @ 3 00	2 50 @ 3 00
" (Dyckerhoff)	2 75 @ 3 15	3 00 @ 3 50	3 25 @ 3 75	3 00 @ 3 25
" (Lafarge)	3 50 @ 3 75	*Not sold.*	3 75 @ 4 25	4 50 @
" (Star)	2 75 @ 3 00	*Not sold.*	*Not sold.*	*Not sold.*
K. B. & S. (Eng.) Portland	2 85 @ 3 10		3 35 @ 3 50	3 00 @ 3 25
Burham " "	2 60 @ 2 80		3 15 @ 3 35	2 75 @ 3 00
Vorwohler	2 65 @ 3 25		3 00 @ 3 25	
German (Fewer)	2 50 @ 2 70	3 15 @ 3 35	3 15 @ 3 35	
" (Alsen)	2 50 @ 2 80	3 00 @ 3 50	3 15 @ 3 35	2 90 @ 3 25
Selenitic		1 65	*Not sold.*	
Hydraulic Lime of Teil	3 50 @ 4 00		*Not sold.*	
Roman	2 75 @ 3 00	@ 3 20	2 75 @ 3 25	3 25 @ 3 50
Keene's coarse	5 00 @ 6 00	@ 7 50	7 50 @ 9 00	6 50 @ 7 00
" fine	9 25 @ 10 25	@ 11 50	11 00 @ 12 50	11 50 @ 12 00
Lime:				
Rockland and Rockport, (Com.)	@ 95	@ 1 10	*Not sold.*	1 00 @ 1 25
Rockland and Rockport, finish	@ 1 15	@ 1 15	*Not sold.*	
State, com. cargo rates (nom.)	75 @ 80	*Not sold.*	*Not sold.*	*Not sold.*
State, finishing "	@ 1 00	*Not sold.*	*Not sold.*	*Not sold.*
Plaster of Paris (calcined)	1 30 @ 1 35	1 70 @ 1 90	@ 1 75	1 60 @ 2 25
" (casting)	1 50 @ 1 65	@ 2 25	@ 2 00	2 25 @ 2 50
Hair (Cattle) ₱ *bush*	25 @ 28	25 @ 30	30 @ 35	24 @ 30
" (Goat)	32 @ 35	@ 30	35 @ 40	@
Sand, ₱ *load*	1 00 @ 1 25	@ 1 50	100 @ 1 25	75 @ 1 50
STONE. (₱ *cubic foot, rough.*)				
Granite: (*Maine*)		@ 60		
Limestone:				
Bedford	@ 1 00	95 @ 1 00	50 @	3 75 @
Joliet	@		35 @ 55	
Lemont	@		35 @ 60	
Serpentine			80 @ 90	

(Continued on page xi.)

10

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Foundation:				
Dimension	@	5 00 ℔ ton	20 @ 28	30 @ 5 00
Block	@	4 60 ℔ perch	8 50 ℔ cord.	50 @ 6 00
Rubble	@	1 25 @ 1 50	8 50 @	
Bluestone: (℔ *sq. ft.*)				
Sidewalk	30 @ 5 00	@ 40	75 @ 1 00	70 @ 90
Planed	50 @ 6 00		50 @ 1 00	1 10 @ 1 25
Sandstone,				
Brown (Connecticut)	1 00 @	1 25 @ 1 45	1 50 ℔ cub.ft.	
Amherst	1 00 @	85 @ 95	55 @ 65	
Berea	75 @ 1 00	80 @ 90	45 @ 55	70 @ 90
Berlin	75 @ 1 00	80 @ 90	55 @ 65	
Bay of Fundy	@ 1 00	*Not sold*	*Not sold.*	
Belleville	80 @ 1 25	1 25 @ 1 35	"	
New Brunswick	@ 1 00	90 @ 1 00	"	
Caen	@	@ 2 00	"	
Marble:				
Lee, Mass.	@	1 75 @ 2 50	*Not sold.*	2 00 @ 2 50
Rutland, white	@	@ 3 00	3 50 @ 5 00	2 25 @ 2 50
Sutherland Falls	1 25 @ 1 75	@ 2 00	3 50 @ 5 00	1 50 @ 2 50
Glens Falls, black	@	2 00 @ 3 00	*Not sold.*	4 00 @ 4 50
Italian, blue-veined	@	50 @ 60	@ 4 40	— @ —
" Sienna	@	3 00 @ 3 50	*Not sold.*	3 25 @ 6 50
Tennessee, red	@	1 25 @ 2 50	@ 4 00	2 00 @ 3 00
" Knoxville	@	85 @ 90	@ 4 00	@ 1 50
Pennsylvania, blue	@		*Not sold.*	2 23 @ 2 50
Vermont, white	@	1 50 @ 2 00	3 50 @ 5 00	
Slate:				
Roofing, (℔ *square*)	@			
" green	7 00 @ 8 00	4 50 @ 7 00	6 25 @ 8 10	@ 7 00
" purple	7 00 @ 8 50	5 50 @ 6 50	@ 8 60	@ 7 00
" red	@ 15 00	13 00 @ 14 00	— @ 16 00	5 00 @ 5 75
" black, Lehigh	— @ —	*Not sold.*	7 20 @ 7 60	5 00 @ 5 75
" " Chapmans	— @ —	*Not sold.*	7 30 @ 8 00	6 00 @ 6 25
Tiles, Am. ℔ M.	@		*Not sold.*	@ 15 00
LUMBER.—℔ M.				
(*Ordinary dimensions.*)				
Boards:				
Pine, 1st quality, clear	65 00 @ 75 00	50 00 @ 53 00	47 00 @ 49 00	
" 2d quality	55 00 @ 60 00	42 00 @ 44 00	42 00 @ 47 00	
" 3d quality	18 00 @ 22 00	35 00 @ 38 00	41 00 @ 45 00	
Spruce	@ 25 00	11 00 @ 12 50	*Not sold.*	
Hemlock	ea. 17 @ 18	12 00 @ 12 50	@ 10 00	11 50 @ 15 00
Yellow pine	20 @ 40	30 00 @ 33 00	@ 28 00	16 00 @ 18 50
Clapboards:				
Pine	@	33 00 @ 55 00	14 00 @ 22 00	—@—
Spruce	@	23 00 @ 30 00	*Not sold.*	—@—
Framing Timber:				
Pine			13 00 @ 15 50	25 00 @ 35 00
Spruce	14 00 @ 18 00	13 50 @ 14 50	*Not sold.*	18 50 @ 20 00
Hemlock	12 00 @ 15 00	@	13 00 @ 19 00	12 00 @ 13 00
Yellow pine	20 00 @ 30 00	21 00 ℔ 25 00		22 00 @ 24 00
Laths:				
Pine	@	2 00 @ 2 25	2 25 @	—@—
Spruce	2 15 @ 2 25	2 00 @ 2 25	*Not sold.*	2 40 @ 2 60
Shingles:				
Pine, shaved	5 00 @ 6 00	@	*Not sold.*	
Pine, sawed	4 00 @ 5 00	@ 4 50	2 25 @ 2 60	
Spruce, sawed	2 50 @ 2 75	@ 1 50	*Not sold.*	
Redwood	2 10 @	@ 3 00	5 50 @ 8 00	30" $10 @ 28
Cedar, split	@	@	*Not sold.*	24" 8 @ 21
Cedar, sawed	@	2 00 @ 3 50	@ 2 30	20" 5 50 @ 14
Cypress 7 x 24	18 00 @ 20 00	5 50 @ 6 00	*Not sold.*	16 00 @ 20 00
Miscellaneous:				
Piles ℔ ft.	4½ @ 6	Piles 6c. ℔ ft.	*Not sold.*	
Fence pickets, Spruce	8 00 @ 10 00	10 00 @ 18 00	Pine, 8 @ 22	12 00 @ 14 00
Cedar posts, 9 ft. (sq. posts.)	@	25 @ 35	9 00 @ 21 00	70 @ 1 25
Chestnut "	@	25 @ 35	*Not sold.*	28 @ 36
Finishing Woods: ℔ M.				
(*First Quality, Kiln-dried.*)				
Ash	@ 55 00	38 00 @ 48 00	35 00 @ 40 00	
Cherry	80 00 @ 120 00	60 00 @ 85 00	75 00 @ 85 00	55 00 @ 65 00
Chestnut	@ 55 00	38 00 @ 50 00	45 00 @ 50 00	60 00 @ 80 00
Butternut	40 00 @ 60 00	60 00 @ 70 00	45 00 @ 60 00	55 00 @ 65 00
Mahogany, Baywood	@ 180 00	100 00 @ 150 00	175 00 @ 180 00	100 00 @
" St. Domingo	@ 350 00	180 00 @ 250 00	250 00 @ 300 00	
Maple	45 00 @ 50 00	45 00 @ 65 00	30 00 @ 35 00	30 00 @ 50 00
Oak, red	@ 70 00	@ 50 00	35 00 @ 40 00	35 00 @ 45 00
" white	@ 70 00	@ 55 00	35 00 @ 40 00	55 00 @ 65 00
" quartered	@ 90 00	65 00 @ 70 00	50 00 @ 55 00	70 00 @ 80 00
Pine, clear	65 00 @ 70 00	3 00 @ 65 00	45 00 @ 50 00	65 00 @ 90 00
Redwood	70 00 @ 75 00	60 00 @ 70 00	60 00 @ 70 00	100 00 @
Rosewood ℔ lb	@ 6		@ 7	
Walnut, black	125 00 @ 150 00	85 00 @ 100 00	85 00 @ 100 00	160 00 @ 200 00
Whitewood	45 00 @ 50 00	40 00 @ 45 00	32 00 @ 35 00	20 00 @ 30 00
Yellow pine ℔ M	@ 45 00	40 00 @ 45 00	32 00 @ 35 00	30 00 @ 35 00
Gumwood, best red			30 00 @ 35 00	
PAINTS. (*In oil, ℔ lb.*)				
White lead, Am.	6½ @ 6½	5½ @ 6½	6½ @ 6½	4 @ 6½
" Zinc, "	5 @ 8½	8 @ 12	7 @ 11	4 @ 8
Red, Am.,	6 @ 6½	@ 12	*Not sold.*	
" Venetian	6 @ 10½	7 @ 12	1½ @ 2½	4 @ 6½
" Vermilion	55 @ 60	55 @ 60 dry	50 @ 75	Am. 12 @ 16
Red Indian, Eng.	12 @ 20	14 @ 20	12 @ 20	12 @ 16
Yellow Ochre	6 @ 13	7 @ 12	3 @ 15	4 @ 9
" Chrome	12 @ 20	18 @ 25	12 @ 25	12 @ 25
Green (chrome)	8 @ 13	12 @ 20	8 @ 20	9 @ 14
Green, Paris,	16 @ 20	25 @ 40	16 @ 35	14 @ 29
Black, lamp,	8 @ 12	15 @ 25	8 @ 30	12 @ 18
Blue, ultramarine	12 @ 18	18 @ 30	10 @ 35	20 @ 35
Oil, linseed, (raw) (℔ gal.)	54 @ 57	55 @ 60	57 @ 59	54 @ 58
" " boiled (℔ gal.)	59 @ 60	58 @ 63	60 @ 62	57 @ 60
Turpentine (℔ gal.)	30 @ 32	37 @ 44	35 @ 38	38 @ 41
Varnish, coach (℔ gal.)	@	1 50 @ 6 00	1 25 @ 2 00	1 40 @ 4 00
Shellac (℔ gal.)	@	2 50 @ 3 00	3 25 @ 4 00	1 75 @ 3 00
Putty	2 @ 3	2 @ 4	02 @ 04	2 @ 2½
Whiting (*dry*)	50 @ 90	1 @ 1½	1 @ 2	½ @ 7-10
Paris white, (Eng.,) (*dry*)	30 @ 2 00	2 @ 3	2 @ 2½	1 30 @ 1 60
Litharge, Am	5½ @ 5½	6½ @ 7	6½ @ 10	6½ @ 7
Sienna, (burnt)	12 @ 17½	14 @ 20	4 @ 16	9 @ 14
Umber, "	11 @ 16½	14 @ 20	@ 10	9 @ 14

(*Continued on page* vii.)

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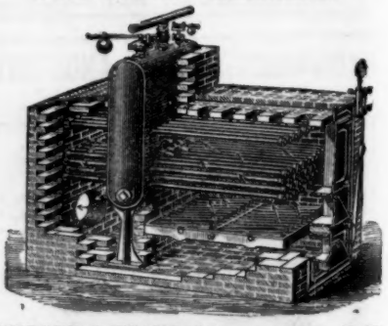

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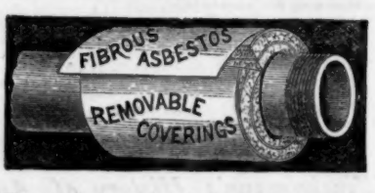

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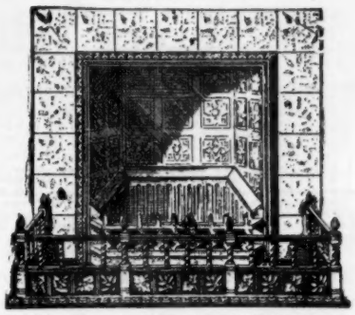

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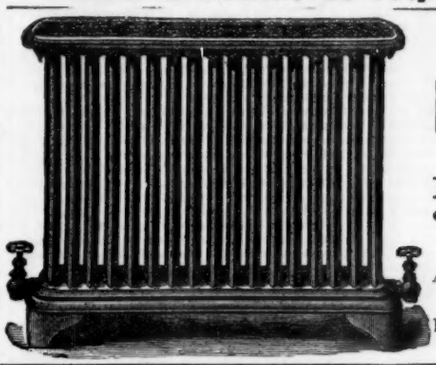

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Nails: (*Per Cask.*)				
Spikes, (*wrought.*)	@ 3 75		3 50 @	@ 3 50
10d. common	@ 3 50	@ 2 50	@ 2 60	@ 3 20
Shingle	@ 4 25	@ 3 50	@ 3 35	@ 3 95
Lath	@ 5 75	@ 4 75	@ 5 60	@ 4 70
(*Finishing nails according to size.*)			Add $1 50	Add 1 00 pr cask
(*For casing nails add 75c. per keg.*)				
Butts: 4″x 4″ (₱ doz. pairs.)				
Plain	@ 1 50	@ 1 20	65 @ 1 00	@ 1 30
Japanned	@ 2 50	@ 1 75	*Not sold.*	@ 1 75
Acorn, Japanned	@ 2 50	@ 2 50	2 00 @ 3 75	@ 2 00
Acorn, Boston finish (₱ pair.)	@ 75	@ 75	*Not sold.*	@ 65
Bronze metal	@ 2 00	plain 2 25	2 00 @ 3 25	@ 1 75
Brass (for cupboards)	@ 15	@ 10	@ 12	@ 15
Knobs: (₱ *Set.*)				
Mineral, best	@ 15	@ 10	8 @ 10	@ 10
Lava	@ 50	@ 75	65 @ 80	@ 1 00
Hemacite	@	@ 38	31 @ 40	@ 27
Porcelain	@ 40	@ 12	25 @ 30	@ 30
Glass, solid	@	@ 75	*Not sold.*	*Not sold.*
Glass, silvered	@ 1 75	88 @ 1 50	@ 1 50	@ 1 75
Bronze metal	1 00 @ 4 00	88 @ 2 00	75 @ 2 50	90 @ 3 00
Brass	1 50 @ 3 00	88 @ 2 00	1 50 @ 3 00	@ 1 25
PLUMBERS' SUPPLIES.				
(*Subject to inaccessible discounts.*)				
Pipe: (*Per Foot.*)				
Cast-iron, 4″, d'ble thick 5 ft. length	4 05 @	@ 75	75 @	@ 75
Cast Iron, 2″ d'ble thick 5 ft. length	2 05 @	@ 35	35 @ 40%	@ 35
Cast Iron 4″ single thick	3 04 @	@ 36	36 @	@ 36
" 2″ " "	1 05 @	@ 24	24 @	@ 24
Wrought-iron, plain, 2″	46 @	@ 26	46 @	@ 46
" " 1″	19 @	@ 8	19 @	@ 19
" " ½″	11 @	@ 4½	11 @	@ 11
" enamelled 2″	64 @	@ 64	24 @	
" " 1″ 45%	28 @	@ 20	28 @ 70%	
" " ½″	15 @	@ 11	25 @	
Galvanized-iron, 2″	54 @	@ 30	64 @	@ 64
" 1″	28 @	@ 10½	28 @	@ 28
" ½″	15 @	@ 06	15 @	@ 15
Brass, drawn, ½″	30 @	@ 25	70 @	
" ¾″	25 @	@ 30	75 @ 25%	
" " 1″		@ 45	75 @	
Lead: (*Per lb.*)				
Pipe 10%	6½ @	@ 7½	6½ @	6½ @
Sheet	7 @	@ 8	7½ @	7½ @
Traps, 8 4″ each	1 90 @		1 90 @	1 90 @
" 8 2″ "	1 10 @		1 10 @	1 10 @
" ½ 8 4″ "	1 55 @		1 55 @	1 55 @
Bath Tubs:				
(*Tinned and Planished.*)				
Copper, 16 oz. 6 ft. 30%	19 75 @	@ 19 75	19 75 @ 25 %	@ 19 75
" 14 oz. "	17 75 @	@ 17 75	17 85 @ 25 %	@ 17 75
Bath Boilers: (*100 lbs. pressure.*)				
Copper, 16 oz., 40 gals. 30%	28 00 @	30 gals @ 18 00	24 00 @ 20 %	@ 34 00
" 14 " 40 "	32 00 @	40 " @ 21 00	24 00 @ 55 %	@ 32 00
Galvanized-iron, 40 gals. 55%	24 00 @		24 00 @ 55 %	@ 24 00
Solder:		16 @ 17	13 00 @ 15 %	
Iron:				
I-Beams up to 12″	@ 4	@ 4	@ 4	30 3½
I-Beams above 12″	@ 4	@ 4	@ 4	
Channel-Beams up to 12″	@ 4 2-10	@ 4	@ 4	

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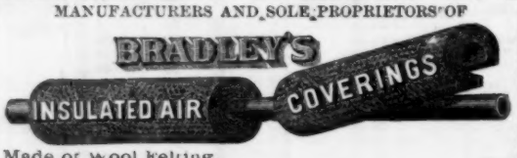

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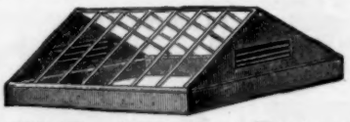

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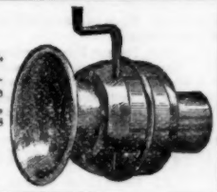

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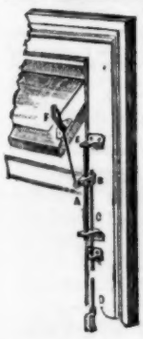

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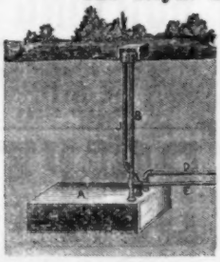

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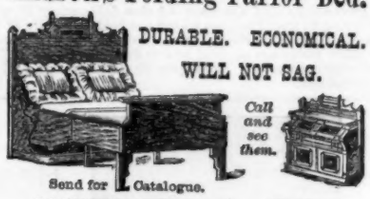

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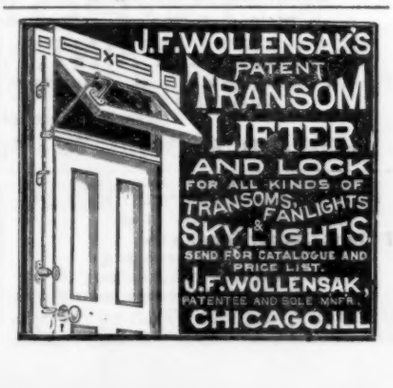

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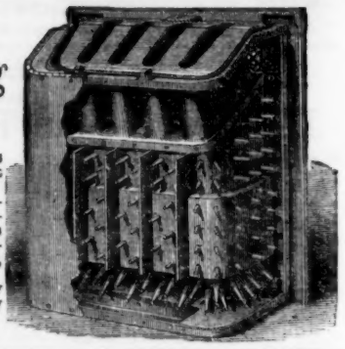

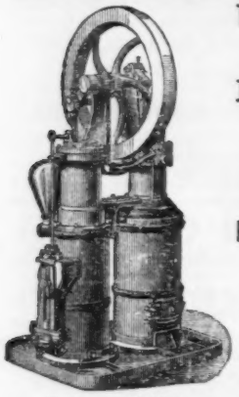

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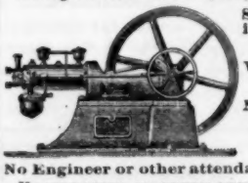

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THE most serious effect of the earthquake of last week seems to have been the disturbance of the foundations of the New Jersey State Capitol at Trenton. Some time ago, according to the New York *Mail and Express*, the structure was observed to have settled, but the movement was a slow one, and attracted little notice. Since the earthquake, however, new indications of impending disaster have been seen, the ceilings have begun to crack, and the occupants of the building, very naturally, are becoming nervous. We trust that no harm will befall them, but cannot help remarking upon the fatality which seems to attach to American State Capitols. To say nothing of the one which collapsed altogether a little while ago, or of that other, which took fire, and burned up so fast that the legislators had to climb out of the windows for their lives, it is remarkable that the costliest and most beautiful of any is regarded by some of those for whose use it was erected as a kind of trap, into which they enter at their peril, while this its near neighbor is said to be in immediate danger from the effect of an earthquake so feeble that not one person in a hundred knew of its occurrence.

ALREADY there is a good deal of talk, both here and in the foreign journals, about the proposed American Exhibition, which is to be opened in London in May, 1886. The Fisheries Exhibition and Health Exhibition have met with so much success as to indicate plainly the advantage of showing special collections, rather than a vast mass of objects from all parts of the world, which confuse the visitor as much as they interest him. Such comparatively small collections can be more effectively arranged and more easily studied than large ones, and leave on the mind a connected and vivid impression, which the large ones rarely do. There can be no doubt about the interest, not only to foreigners but to Americans, of such an exhibition as an experienced manager of such affairs, with a little imagination, and a talent for arrangement, could easily prepare; and if, as we think, the curiosity as well as kind feeling with which English, French and Germans alike regard everything which relates to the United States would alone almost insure success, this would be rendered still more certain by the patriotic pride which would induce thousands of Americans to cross the ocean in the wake of their contributions, or those of their friends, to see that they received due appreciation.

VERY little is yet known of the details of the Exhibition, but it seems probable that the great railroads, with, perhaps, the public authorities of the States which make more effort to attract immigration, will occupy a considerable portion of the space with the maps and collections of mineral and vegetable products which the Australian Governments have set the example of exhibiting in London. Next to these, the manufacturers of certain varieties of goods will probably be represented, although the feeling of aversion to any movement by which their foreign rivals might be put in possession of their processes or patterns, which kept American manufacturers generally from exhibiting at Vienna, is likely to militate against the success of this part of the enterprise. To make up for this, however, the picturesque features of American life are to be shown with as much fidelity as possible. According to the programme, an American theatre is to be constructed, where performances will be given by American actors and negro minstrels; a roller-skating rink will be provided, and a California wine-shop, a Florida fruit-store, a Wall-Street broker's office, and a Nevada camp-fire will be among the attractions. We should imagine that the managers might find it worth while to make terms with the Buffalo Bill company, which would present in a most attractive manner the kind of American life which appeals best to the preconceived notions of the average foreigner.

THE officers of the Workingmen's Institute connected with the Wells Memorial Association in Boston have sent out their fifth annual report, which has a singular interest. Nothing could be less flowery or sentimental than the text of the report, but the picture which it presents of the admirable management and influence of the Institute is full of encouragement for those who desire to promote by such means the usefulness and happiness of their fellow-citizens. The Wells Memorial, it may be observed, has had the advantage of a moderate invested fund for sustaining its early efforts, but it owes its success much less to this than to the zeal and ability with which its affairs have been conducted. Few associations of the kind could hope to begin their work under conditions quite so favorable, and it is fortunate that the Boston Institute has been able to lead the way in a path which will be followed by many others.

IN general, the Wells Memorial, like other workingmen's clubs or institutes, is intended to furnish instruction and amusement for the younger men in that part of the city who happen to be without acquaintance, or who wish to enjoy the varied recreations which the Association offers. To say that its advantages are intended for workingmen is rather meaningless, since that term applies to every man in the United States whose society is worth cultivating, but the name serves to indicate the distinction existing between it and the local Christian Associations, whose object is primarily the extension of religious influences over young men, while the one of which we speak cares rather for the development in them of the qualities which lead to happiness and success in secular affairs. With this intention, a deserved prominence is given to the provision of opportunities for economizing and investing money under skilful direction, and with a clear understanding of the processes involved. The members of the Association already carry on three coöperative banks, whose united assets amount to more than three hundred thousand dollars. These banks are under the supervision of the State Savings-Bank Commissioners, but pay to their stockholders, nearly two thousand in number, a much larger return than most savings-banks, amounting, in the case of the only one of which a full report is given, to about seven per cent for the past year.

ANOTHER excellent feature of the association is an arrangement by which coal, flour, groceries and provisions, clothing, boots and shoes, hats and caps, crockery, house-furnishing goods, furniture and hardware, are supplied to members at a reduction of about ten per cent from the retail prices. To our mind no detail of the management shows more wisdom than this, which serves not only as a direct benefit to the members, amounting to a gift of from fifty to two or three hundred dollars a year, according to the mode of life of each, but gives the younger ones a lesson and example in the duty of care in spending money, which they are never likely to forget. For men who have once formed the habit of saving needless expense, and of investing their savings judiciously, the future is as secure as anything can be in this world, and those who have learned the economic lessons which the Association is ready to teach them can afford to indulge in the relaxations which it offers for their leisure hours. Among these are entertainments of various kinds, lectures, concerts, and evening parties, besides a debating club, a gymnasium, a game-room, and a reading-room, with which is connected a library. This last deserves to be a

large one, and might well take the form of a technical collection rather than one of popular books, which can be had only too freely from the public libraries.

A NEW light has been brought into use in England, apparently involving the principle of flameless combustion to which Mr. Fletcher's experiments have given so much interest. As now employed on a large scale at the Euston station in London, the lighting apparatus consists of a burner supplied with a mixture of coal-gas and common air, in the proportions necessary for perfect combustion, these being, we suppose, about eight parts of air to one of gas. The mixed gases are delivered under pressure, as with the usual gas service, and over each burner is placed a cap of platinum-wire gauze. The gas, when once lighted, burns without flame around the platinum gauze, which is raised to a brilliant white heat by the combustion. As there is no flame, the lights are perfectly steady, and although not protected by globes or shades of any kind, are affected neither by wind nor rain, while more than twice as much light is obtained with a given consumption of gas as under the old system. The burners at present in use are arranged for a supply of eighteen feet of gas each per hour, but they actually consume only twelve and one-half feet, and twenty of the burners light in a satisfactory manner a platform nine hundred feet long, replacing fifty lamps of the old kind.

EVERY journal, however limited its scope, ought to do its part to make public the fact of the recent establishment in New York, Connecticut and Ohio of Agricultural Experiment Stations, founded and maintained by the State, and devoted entirely to the collection of facts which will be of service in the agriculture of the neighboring country. In that of Connecticut, which has been in existence two years, tests have been made of more than four hundred kinds of seed within twelve months, and fifty analyses have been made of fertilizers and other substances used in agriculture. Besides experiments upon the effect and comparative value of manures, natural and artificial, investigations are carried on in regard to the causes of mildew, rust, and other diseases of plants, with the best means of cure; and cattle and horses are also studied and treated scientifically. The bulletins which show the results of these inquiries are sent to all who wish for them, and letters of inquiry from those who wish for information on agricultural matters are promptly answered. One of the main reasons why the bulletins of a State establishment of this kind are, or ought to be, so much more useful than any other sort of technical literature is that they deal with the same climate, weather and circumstances as those under which their readers are or have been working, and the farmer in Litchfield who is troubled with a new sort of caterpillar, or the florist in New Haven whose rose-plants mildew persistently, are sure to find from the next bulletins that their neighbors have suffered in the same way, and have asked, generally with success, for information to help them in overcoming the troubles which afflict them. It is becoming every year more evident to those who watch the stock-markets, the great index of general prosperity or distress, that by far the most important factor in the life of the country is the agricultural interest. With good crops trade and manufactures flourish; without them all business languishes; and he who can show how to secure fruit-trees from insects or grain from parasites, or can point out the way to satisfy that universal need, a cheap mode of fertilizing exhausted fields, will deserve and receive the gratitude of the whole community.

A READY way of estimating distances in military operations, is described in the *Scientific American*, which translates it from the pages of *La Nature*. The only instrument required is a small piece of cardboard, out of which is to be cut a figure of a man, standing erect, the whole figure being, we will say, an inch in height. An extra piece of cardboard must be left below the figure to serve as a handle, with a pronounced horizontal line to represent the ground on which the figure stands. To test the instrument, a man is to be stationed upon a given point, holding the pasteboard figure in his hand. Six hundred and sixty feet behind him is to be placed another man. The observer then takes his place ten feet in front of his fixed point, and compares the little figure held in the hand of his assistant with the appearance of the man far off behind him. If the distant man is of the average height, five feet seven inches, his outline should coincide exactly in size with that of the pasteboard figure. After the instrument is found to be correct, it is only necessary in using it for ascertaining the distance of a man from the observer to hold or set up the figure at a convenient point, and then move backwards or forwards, keeping the figure in range with the remote man, until the two are found to correspond in size. Measure then the distance from the eye to the figure, and multiply by sixty-seven. The product will be the distance in feet from the observer to the distant object. If the observations are taken with care, the margin of probable error is quite small. The man whose distance is to be calculated may be above or below the average height, and this will affect the result, but only to the amount of one-tenth or one-twelfth of the whole. In practical service, however, the greatest advantage gained by using the instrument is the practice which it affords in observing closely the appearance of persons at various distances. After the actual distance of men whose image presents certain characteristics of size and detail has been repeatedly ascertained, the eye forms a series of standards for itself, and a person accustomed to using the instrument can soon dispense with it in emergencies, and form without it an estimate of distances which usually approximate very closely to the truth.

THE city of Paris was recently made the recipient of a bequest from a M. Forney, amounting to forty thousand dollars, and has taken an admirable way of using the money, by establishing with it a technical and professional library, which will be known as the Forney Library, and is to be open to all who wish to avail themselves of the advantages which it offers. In order to render it as generally useful as possible, the library is to be open from nine in the morning till five in the afternoon of every week day, and again from seven till ten in the evening, and on Sundays from noon to five o'clock; and students will be allowed to make tracings of drawings or engravings, and even to take such things home, to copy them at leisure. The library will open in October, and as soon as it is properly organized, courses of lectures are to be prepared for the benefit of those who wish to avail themselves of the privilege of listening to them. It will be seen that a library of this kind, to be so used, is a novelty among collections of books for public use. At present scientific or professional societies often possess libraries which their members are permitted to consult very freely, and many of them also provide lectures and discussions on the topics relating to their special work; but membership in such societies is generally beyond the reach of students, particularly the poorer ones, and the idea of establishing a general technical society, open to all who desire to profit by it, is a very happy one.

A CARPENTER writes to the *Scientific American* to say that in 1864 he had occasion to build a coal-bin in the yard of his house, and laid some old painted half-inch door panels on the ground to form the floor. Seven years afterward he took them up, and found them entirely free from decay. They were saturated with moisture, and so soft that, as he says, he could have bent one of them around a six-inch stovepipe, but were as sound as if just cut from the tree. Unfortunately, the writer of the letter says nothing about the wood of which the panels were made, the character of the ground on which they were laid, or the color with which they were painted, so we cannot tell whether he has made a remarkable discovery or not. If the ground was springy, so that the boards under the coal bin were constantly wet, they would have remained sound for ages, painted or unpainted, and almost without regard to the sort of wood of which they were made. If this was not the case, and if the bin did not hold water which would serve to keep the boards moist, it would be worth while to inquire into the other circumstances. So far as we know, no one has investigated the effect of arsenical paints in preserving wood from decay, but it is not unusual for boards or sticks painted green, and half buried in garden soil, to resist decay for a surprising length of time, and a good coat of Paris green, or London purple, applied in such a way as to strike into the pores of the wood, might have antiseptic powers of great value. The carpenter who writes about the painted panels suggests that the treatment which preserved them might be applied to railway sleepers, and if it should prove that the life of these could be materially lengthened by dipping them in any sort of cheap paint, the discoverer of the proper pigment for the purpose would deserve well of his fellow-men.

SANITARY PLUMBING.[1] — XXVIII.

(*d*) *The Plain Screw-Joint.*

FIGURE 180 represents the ordinary screw-joint as used by steam-fitters for connecting wrought-iron pipe. Figures 181 and 182[2] show an improved screw-joint formed with a view to forming a smoother connection between the pipes. It will be seen that, with the ordinary steam-fitter's screw-joint (Fig. 180), interior depressions are left when the pipe is screwed up which will collect sewage. In this system, however, the fittings are tapped with a shoulder so that when the pipe is screwed home its interior and that of the fitting form a practically continuous line. A small recess only is left between the end of the pipe and the shoulder, because all pipes do not screw up equally. These recesses are, however, very small and the amount of sewage which they can collect is too slight to be taken into account, and no more than is collected in the inevitable recesses left between the end of the spigot and the inner shoulder on the bell of an ordinary calked-joint.

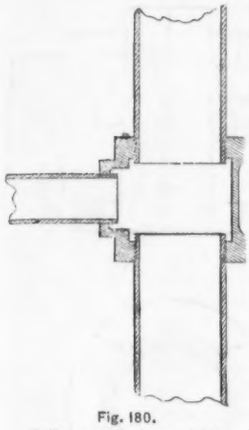


Fig. 180.
Ordinary Plain Screw-Joint.

In the best work the thread is cut slightly tapering, and about eight threads per inch on pipes from two to six inches in diameter. The threading is done on powerful tapping machines.

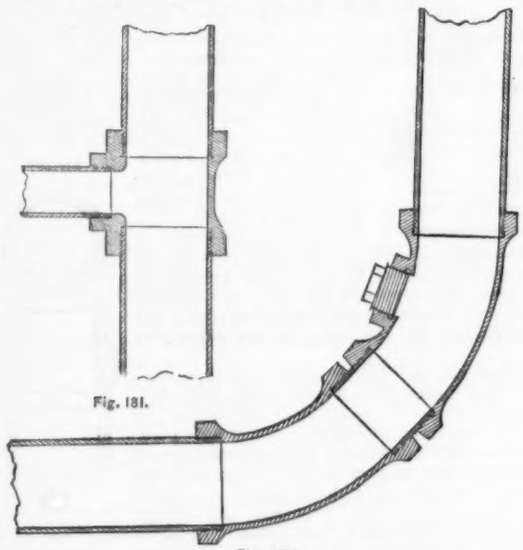


Fig. 181.

Fig. 182.
Improved Plain Screw-Joints.

There is considerable advantage in the tapered threading. In Figure 183 is shown on a large scale, somewhat exaggerated for clearer illustration, a threading gradually tapering until it vanishes at the exterior of the pipe. The strength of the pipe is maintained by this method of tapering, and all the threads have a bearing.

Fig. 183.
Tapering Thread.

Fig. 184.
Ordinary Straight Thread.

Figure 184 shows the ordinary threading. The pipe here being weakened by the full depth of the threading, is liable to crack at the points shown in the drawing, and only a certain number of the threads do the work of the whole. The wrought-iron pipes are screwed into the couplings or fittings by means of chain-tongs, on which a man can exert a powerful leverage, thus securing, with the aid of a paste of white and red lead and oil, a perfectly tight joint. The pipes are cut and fitted at the factory, ready for rapid putting together at the building. The bends, branches, and other fittings used with the straight lengths of wrought-iron are constructed of cast-iron.

In cases where it is necessary to disjoint wrought-iron piping, one of the fittings has to be broken and the wrought-iron straight piece adjoining can then be unscrewed. There is less danger of accidentally cracking more than one piece of the pipe than is the case with cast-iron bell-and-spigot pipes. In the latter case a heavy knocking to break the pipe is liable to loosen or destroy a great many joints.

On the other hand, the cutting of the cast-iron pipe for alterations is easier than that of wrought-iron. Wrought-iron pipes require costly machinery for proper cutting and threading, and the lengths must be measured accurately and put together by skilled mechanics. Hence, where wrought-iron pipe is used in plumbing, it is desirable to employ those who make a specialty of this work.

IV. FLANGE-JOINTS.

Flange-joints are those which are made with flanges forming bearings for bolts or clamps, by which the pipes are secured together. Our first example is: —

(*a*) *The Spigot-and-Socket Flange-Joint*

represented in Figure 185. The pipes are here made with circular flanges, one having an annular groove on one end, and the other a corresponding annular projection or spigot, both being slightly bevelled. The flanges have four or more slots in their periphery, at uniform distances apart. A suitable packing-ring, preferably of lead, is placed in the groove and compressed by screwing up the bolts which pass through the slots. The ordinary steam-fitter's flanged-joint differs from this in having plain level surfaces without groove or spigot. The steam-fitter's packing consists of paper, leather, or rubber washers, with or without putty, red lead or other filling. Usually the surfaces of the flanges have to be planed off by machinery to give the proper tightness, and, instead of slots, holes are generally used to take the bolts. These kinds of joints are unsuitable for plumbing purposes, because they are not adjustable, or as has already been described, do not admit of slight variations in direction of the piping, as is absolutely necessary in plumbing work. The machine planing of the steam-fitter's flanged pipes, moreover, involves too great an expense to render the joint practicable for plumbing purposes.

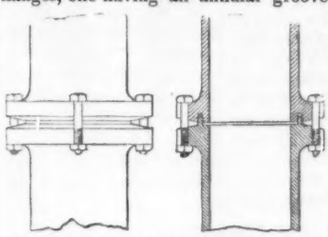


Fig. 185. — The Spigot-and Socket Flange-Joint.

Figures 186, 187 and 188, show a joint devised with a view to overcome the first of the above-mentioned objections to the ordinary flange-joint. On each side of the pipe are cast curved projections or collars extending only partially round its circumference. A flanged collar, recessed to correspond with the curved projections, is slipped over the end of each pipe and turned partly round behind the projections. The flanges are thus held securely on the pipe, which may be adjusted in a variety of positions. An annular connecting piece,

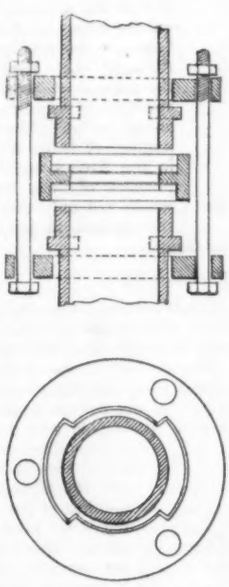


Fig. 186 and 187. — Fange-Joint with ring.

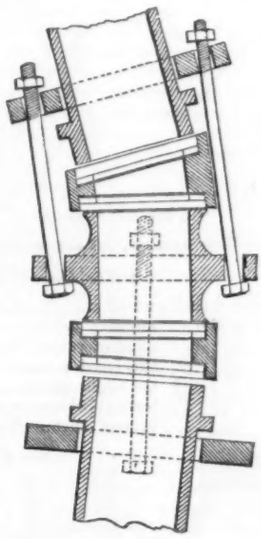


Fig. 188. — Joint with Bevelled Connecting Pieces.

recessed to receive packing-rings, is placed between the pipes to be joined. These connecting pieces are made with one or both faces at any desired angle to the bore of the pipes. A short portion at each end of the pipe is made somewhat thicker than the main length, so

[1] Continued from page 44, No. 448.

[2] We are indebted to Mr. William Paul Gerhard, Chief Engineer of the Durham House Drainage Co., for these drawings, which were made for us at our request, to illustrate the system of jointing adopted by this Company.

that at the extreme ends a wider surface of metal is obtained for the packing-ring to rest against.

Figure 188 shows the same joint with the bevelled connecting pieces to give a change of direction to the piping. There are several objections to this form of joint. The slotted collars occupy too much space and are liable to be easily broken in screwing the pipes together. Moreover, the arrangement, though allowing of a certain amount of play of the pipes in adjusting them, still limits their movement and would cause considerable annoyance in handling, The very long bolts are expensive and awkward; the heads and nuts do not rest square on their bearings when the bevelled connecting rings are used. The bolts would therefore be very easily broken in screwing up unless bevelled washers were used, which would still further increase the cost.

Figure 189 gives another form of flange-joint devised with the same end in view. At one end of each length of pipe is a cone-shaped socket, having at opposite sides two lateral projecting lugs with bolt-holes. On the other end of the pipe, which is plain, is placed a loose flanged collar, which has bolt-holes to coincide with the holes in the lugs of the socket, into which the end or neck of the collar is free to enter. A packing-ring of India-rubber, hemp, or other suitably elastic, compressible substance, is placed on the end. The neck of the collar is then slid forward into the socket, and it is brought to bear upon the packing by means of bolts, which are passed through the bolt-holes. This joint is neither permanent nor tight under pressure. Moreover, it offers no resistance to longitudinal strain, by which the two pipes might be drawn apart.

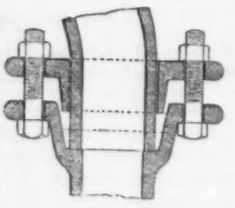


Fig. 189.

(b) The Spherical Flange-Joint.

Figures 190, 191 and 192 show another device designed for variable adjustment of the pipes. The parts at the points of junction are of spherical form, and the parts of the spheres where the junction takes place are inclined, by preference, to an angle of 45°, with the axis of the pipes, and are fitted with suitable packing and bolted as shown. This form of joint is evidently unsuitable for plumbing purposes. Should the bolt be made to pass through the centre of the pipes, as shown in the second and third figures, it would form an obstruction to the flow of the sewage. If, on the other hand, the bolts are made to pass through the flanges, the amount of possible variation of adjustment would be limited to the number of holes made in the flanges, and the piercing of these holes would not only add to the expense in proportion to their number, but also weaken the flanges.

Fig. 190.

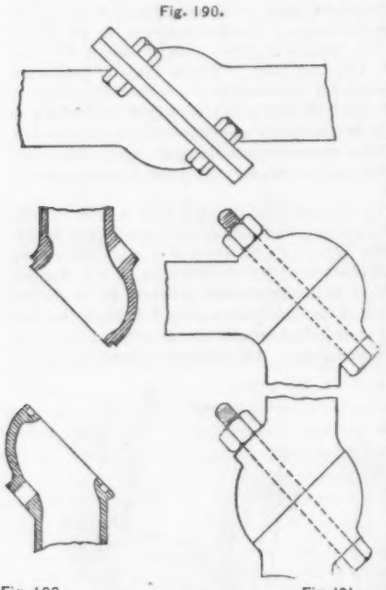


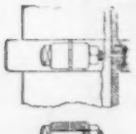
Fig. 192. Fig. 191.

The Spherical Flange-Joint.

(c) The Loose-Ring Flange-Joint.

Around each end of the pipes to be jointed is formed a projecting annular flange or rib of rectangular section. A band of rubber is placed over the joint, and upon this band a cast-iron collar or belt in two halves. the edges of the iron band turn inwards so as to form shoulders on each side of the rubber band to protect them. The joint is perishable and unreliable under pressure. Figures 195 and 196 represent another form of the same kind of joint. The pipes are formed with a bevelled flange. A rubber ring is used, as before, as packing, but the ring is placed between the ends of the pipes instead of around the joint. The metallic ring which holds the pipes together is double-wedge shaped in section, and slotted so as to allow it to be passed over the flanges. A bolt with a wedge-shaped head is used to hold the whole in place.

Fig. 193.



Second Form.

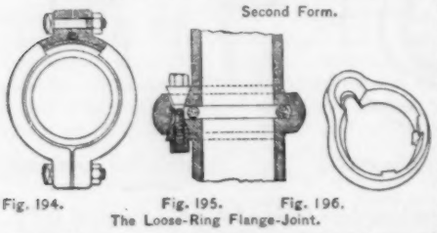


Fig. 194. Fig. 195. Fig. 196.

The Loose-Ring Flange-Joint.

(d) The Wedge-and-Key Flange-Joint.

The flanges are here connected by means of dovetailed wedges or cotters and keys, instead of the ordinary bolts and nuts. Instead of the ordinary slotted openings, which are usually formed in the flange at each end of the pipe for the connecting bolts, the openings have a dovetail form as shown in plan, Figure 199. When the faces of the flanges, with their intermediate packing, are placed in position to be connected, dovetailed cotters or wedges are passed through the dovetail openings in the flanges, in the direction of the length of the pipes, and drawn up tight by keys driven through slotted holes in their ends.

Fig. 197.

The Wedge-and-Key Flange-Joint.

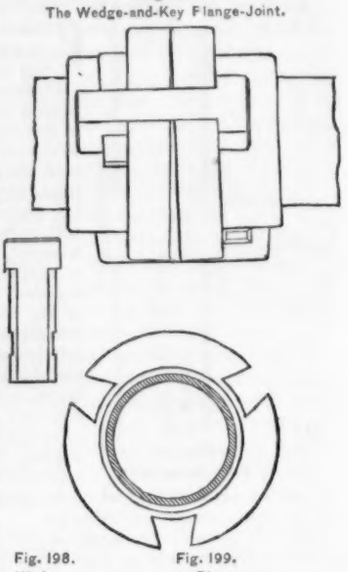


Fig. 198. Fig. 199.

Wedge. Plan.

(e) The Plain Non-Adjustable Flange-Joint.

The flanges of the joint used for illustration have on their meeting surfaces annular grooves, circular or otherwise, to receive a packing-ring, similar in form and composed of vulcanized India-rubber, hemp, or other suitable elastic material. The grooves in the flanges must be of corresponding size, so that one-half portion of a packing-ring may lie and be compressed in each when the flanges are drawn together. The object of the grooves is to prevent lateral derangement of the packing-ring under the influence of steam or water pressure in the pipes. The flanges of this joint are sometimes square with rounded corners, instead of round, and in the corners are the holes for the connecting bolts.

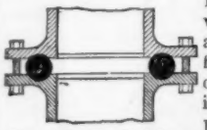


Fig. 200.—The Plain Non-Adjustable Flange-Joint.

Fig. 201.

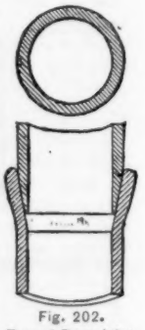


Fig. 202.

Turned Rust-Joint.

Figures 201 and 202[1] represent a turned rust-joint. It is made by turning the inside of the hub and the outside of the spigot to fit each other. In order to allow for a little deviation from right lines, the spigot-ends of some of the pipes are turned spherical, so that they will still fit, though not in an absolutely straight line with the length of pipe in which they are inserted. The pipes and fittings may be adjusted accurately at the factory to the position they are to occupy in the building, or a special turning apparatus may be used at the building to do the whole or any part of the cutting and turning. "With accurate turning," says Col. Waring, "the joint is absolutely tight at the outset. Experiment has shown that very considerable leakage, much more than would be caused by any ordinary inequality of the work, very soon closes itself completely by rusting."

The Great Imambara, Lucknow. — But, whatever of architectural fame Lucknow has is embodied in the great Imambara. Even this is of brick plastered over, but one quite forgets that in the first burst of superficial admiration. The entrance to the tomb — for it is a tomb, like many of India's grandest palaces — is marked by the usual richly-decorated double gateways, within which is a large tablet inscribed with the British lion and unicorn and the universal "*Dieu et mon Droit.*" The real Imambara stands upon an elevated terrace at the rear of a spacious court filled with fountains and flowers. It was built by Nawab Asafud-Daulah, at an inestimable cost. He was anxious to perpetuate his memory, and required the architects to submit their plans to a competition, each one vouching that his building should be a copy of no existing structure, and that it should surpass everything of the kind ever built in architectural beauty. Kaifiat-ullah, the successful competitor, builded well, and I humbly bow before this graceful monument of the art of antiquity. The dimensions of the grand hall are 52′ 6″ x 167′, and at each end are octagonal apartments fifty-three feet in diameter. The interior is filled with the same exquisitely useless insignia that I noticed in the Shah Nazzuf. Around about the Imambara are various magnificent foundations and incomplete structures, left by this same Nawab. There is an insipid musjid intended to surpass the famous Jumma Musjid of Delhi, but at his death it failed to materialize further. There are also four stories of a gigantic watch-tower which he started, that he might look down from its top upon "the great Babylon that he had built," also falling into decay. — *Correspondence of Philadelphia Press.*

[1] This figure was drawn for us by Col. Waring, by whom the joint was devised. It is called the "Dececo" joint.

THE ESSENTIAL DIFFERENCE BETWEEN THE WORK OF THE MEDIÆVAL AND THE MODERN CRAFTSMAN.[1]

WE, of this Society at least, know the beauty of the weathered and time-worn surface of an ancient building, and have, all of us, felt the grief of seeing this surface disappear under the hand of the "restorer;" but though we all feel this deeply enough, some of us perhaps may be puzzled to explain to the outside world the full value of this ancient surface. It is not merely that it is itself picturesque and beautiful, though this is a great deal. Neither is it only that there is a sentiment attaching to the very surface which the original builders gave their work, but dimly conscious of the many generations which should gaze on it. It is only a part of its value that the stones are felt to be, as Ruskin beautifully puts it in speaking of some historic French building (now probably changed into an academical model of its real self), that they are "the very stones which the eyes of St. Louis saw lifted into their places." That sentiment is much, but it is not all; it is but a part of the especial value of the old surface, which is briefly that it bears witness to the development of man's ideas, to the continuity of history, and in so doing affords never-ceasing instruction, nay, education to the passing generation, not only telling us what were the aspirations of men passed away, but also what we may hope for in time to come.

A different spirit has animated history in these latter days from that which used to be thought enough to give it interest to thinking men. Time was, not so long ago, when the clever essay writer made his history, surrounded by books whose value he weighed by the degree to which they conformed to an arbitrary standard of literary excellence rather than by any indications they might give of being able to afford a glimpse into the past. These historians were not fitted for their task, for the world of history which they pictured to themselves was an unreal one. To them there were two periods of continuous order and organized life: the period of Greek and Roman classical history was one; the time from the development of the retrospection into that period till their own days was the other; all else to them was accidental confusion, strange tribes and clans with whom they had no relation jostling against one another to no purpose. The mists of pedantry slowly lifted and showed a different picture — inchoate order in the remotest times, varying, indeed, among different races and countries, but swayed always by the same laws, moving ever forward toward something that seemed the very opposite of that from which it started; yet the earlier orders, never dead, but living in the new, and slowly moulding it to a recreation of its former self.

The instruments of this new knowledge of history were chiefly two; study of language and study of archæology, the expression of men's ideas by means of speech and of handiwork, and it is of the latter I am bound to speak, and it is of the function of this Society to keep before people's eyes its importance as an instrument of the study of history. So far, I am sure I have carried you with me.

You cannot doubt that in one way or other the surface of an ancient building, the "handling" of the old handicraftsmen is most valuable and worthy of preservation, and you also instinctively feel that it cannot be reproduced at the present day; that the attempt at reproduction not only deprives us of a monument of history, but also of a work of art. I shall now attempt to show you that this impossibility of reproduction is not accidental, but is essential to the condition of life at the present day; that it is caused by the results of all past history, and not by a passing taste or fashion of the time, and that, consequently, no man, and no body of men, however learned they may be in ancient art, whatever skill in design or love of beauty they may possess, can persuade, or bribe, or force on workmen of to-day to do their work in the same way as the workmen of King Edward I's time did theirs.

Wake up Theodoric the Goth from his sleep of centuries, and place him on the throne of Italy; turn our modern House of Commons into the Witenagemote of Alfred the Great — no less a feat is the restoration of an ancient building. In order to show you that this is necessary and inevitable, I must touch upon the conditions under which handicraft has been produced from Classical times onward, and in doing so I cannot avoid certain social problems, in the solution of some of which you may differ from me. It must be admitted that every architectural work is a work of coöperation. The very designer, be he never so original, pays his debt to this necessity in being, in some form or other, under the influence of tradition. Dead men guide his hands even when he forgets that they ever existed. Furthermore, he must get his ideas carried out by other men. No man can erect a building with his own hands. Every one of these men depends for the possibility of ever beginning his work on some one else. Each is but part of a machine; the parts may be but machines themselves, or they may be intelligent; but in either case they must work in subordination to the general body. Men so working must be influenced in their work by the conditions of life, and the man who organizes the labor must make up his mind that he can only get labor of a kind which those conditions have bred. To expect enthusiasm for good workmanship from men who for two generations have been accustomed to work slovenly would be absurd: to expect consciousness of beauty from men who for ten generations have not been allowed to produce beauty, more absurd still. The workmanship of every piece of coöperative work must belong to its period, and be characteristic of it. Thus, all architectural work must be coöperative; in all coöperative work the finished wares can be no better in quality than the lowest, simplest, or widest grade, which is also the most essential, will allow them to be, and the kind and quality of that work, the work of the ordinary handicraftsman, is determined by the social conditions under which he lives which differ most from age to age.

Let us try to see how they have differed, and glance at the results of that difference, during which inquiry we shall have much more to do with the developed Middle Ages, with the work of which our society is chiefly concerned, than with any other period.

In the Classical period industrial production was chiefly carried on by slaves, whose person and work alike belonged to their employers, and who were sustained at just such standard of life as suited the interests of the said employers. It was natural that under such circumstances industrialism should be despised: but under Greek civilization, at least, ordinary life for the free citizens, the aristocracy, in fact, was simple; the climate was not exacting of elaborate work for the purposes of clothing and shelter; the race was yet young, vigorous, and physically beautiful. The aristocracy, therefore, freed from the necessity of rough and exhausting work by their possession of chattel slaves, and little oppressed with anxieties for their livelihood, had, in spite of the constant brawling and piracy both inclination and leisure to cultivate the higher intellectual arts, within the limits which their natural love of the matter-of-fact and hatred of romance prescribed to them; the lesser arts meanwhile being kept in rigid, and indeed, slavish, subordination to them, as was natural. Had any Athenian gentleman attempted to build a Gothic cathedral in the days of Pericles, what sort of help would he have had from slave laborers of the day, and what kind of Gothic would they have produced for him? The ideal of art established by the intellect of the Greek, with such splendid and overwhelming success, lasted throughout the whole Roman period also, in spite of the invention and use of the arch in architecture, or rather in building; and side by side with it chattel slavery, under somewhat changed conditions, produced the ordinary wants of life. The intellectual arts of Classical times had, even in Pliny's days, long fallen from their zenith, and had to wade through weary centuries of academicalism, from which they were at last redeemed by no recurrence of individual genius to the earlier and human period, but by the break-up of Classical society itself, which involved the change of chattel slavery into serfdom or villeinage, on which the feudal system was based, In place of the system of aristocratic citizen and chattel without rights, dominated by the worship of the city, which was the ideal of Classic society, was formed a system of personal duties and rights, personal service and protection in subordination to *à priori* ideas of mankind's duties to and claims from the unseen powers of the universe. The serf was in a very different condition from the chattel slave; for, certain definite duties being performed for his lord, he was, in theory at least, at liberty to earn his living as he best could within the limits of his manor. This chattel, as an individual, had the hope of manumission, but collectively there was no hope for him but in the overthrow of the society founded on his subjection. The serf, on the other hand, was by the conditions of his labor forced to strive to better himself as an individual, and collectively soon began to acquire rights amidst the clashing rights of king, lord, and burgher. Also, quite early in the Middle Ages, a new and mighty force began to germinate for the help of labor, the first signs of secular combination among free men, producers and distributors.

The guilds, whose first beginning in England dates from before the Norman Conquest, although they fully recognized the hierarchical conditions of society, and were indeed often in early times mainly religious in their aims, did not spring from ecclesiasticism. England and Denmark were the foremost countries in the development of the guilds, which took root latest and most feebly in the Latinized countries. The spirit of combination spread; the guilds, which at first had been rather benefit-societies or clubs, soon developed into bodies for the protection and freedom of commerce, and rapidly became powerful merchant guilds. In the height of their power there formed under them another set of guilds, whose object was the regulation and practice of crafts in freedom from feudal exactions. The older merchant guild resisted these newer institutions, so much so that in Germany there were bloody and desperate wars between them. In England the merchants' guilds changed in a peaceable manner, and became in the main the corporations of the town, and the craft guilds took their deputed place as regulators and protectors

[1] By William Morris, M. A. A paper read before the Society for the Protection of Ancient Buildings on Tuesday, July 1st.

of all handicrafts. By the beginning of the fourteenth century, the supremacy of the craft guilds was complete, and at that period their constitution was thoroughly democratic. Mere journeymen there were none, for the apprentices were sure, as a matter of course, to take their places as masters of their craft, when they had learned it.

Let us now look at the conditions of the life of the craftsman. He lived, however roughly, more easily than his successor does now. He worked for no master save the public; he made his wares from beginning to end himself, and sold them himself to the man who was going to use them. This was the case with nearly all the goods made in England, all the more so as the materials of any country were chiefly wrought into goods close to their birthplace. It followed, from the direct intercourse between the maker and the consumer of goods, that the public in general were good judges of manufactured wares, and that the art of adulteration was scarcely known. Now, as to the manner of work. There was little or no division of labor in each craft, which was some mitigation of the evil of a man being bound down to one craft life-long — some mitigation because there was plenty of variety in the work of a man who made the whole of a piece of goods himself, instead of making one little piece of a piece. The English craftsman of the fourteenth century was not the priest-ridden, down-trodden savage of whom pedant historians have written, but a thoughtful and vigorous man, and in some sense free. He worked, not for the profit of a master, but for his own livelihood, which he did not find it difficult to earn, so that he had a good deal of leisure. Being master of his tools and his material, he was not bound to turn out his work shabbily, but could afford to amuse himself by giving artistic finish. Such finish was not venal; it was given freely to the public, who paid for it by interest in and sympathy for the work itself. For all that, what are now called "the wages of genius" were much neglected by the builders of our ancient buildings; for all that, craftsmanship, as Mr. Thorold Rogers says, was widespread; the possession of some skill in it was the rule, and not the exception. Those who could afford to pay for a building were able to do the necessary planning and designing, obviously because they could naturally find help and harmonious intelligence among the men they had to employ. It followed from this widespread skill in the arts, that those poor wretches who had skill and taste beyond their fellow workmen, and who consequently had pleasanter work than they, had to put up with a very moderate additional wage, or with nothing additional. They could not make good the claim now preferred for that much sinned against and that much sinning company, men of genius, that the conformation of their stomachs and the make of their skin is different from other men, and that consequently they want more to eat and drink, and different raiment from their fellows.

When we hear that extra money payment is necessary under all circumstances to produce great works of art, we can appeal to the witness of those lovely works still left to us, whose unknown, unnamed creators were content to give them to the world with little more wages than their pleasure in their work and their sense of usefulness in it might give them. A body of artificers so living and so working with simple instruments, of which they were complete masters, had very great advantages for the production of architectural art, using that term in its widest sense, and that one would expect to find in their work that thoughtfulness and fertility of resource, that blended freedom and harmonious coöperation, which we actually find in that work. Nevertheless, the mediæval workman was still compelled to work only as tradition would allow him to do. If it could ever have occurred to any man to build some new Parthenon or Erectheum by the banks of Thames, Wharfe, or Wensum, in the fourteenth century, how far do you think his fellow workman's skill would have been able to second his folly?

Hurrying on from this fourteenth century, we see that, although the constitution of the craft's guild was at first thoroughly democratic or fraternal, it did not long remain so. As the towns grew bigger the old craftsmen began to form a separate and privileged class in the guilds, with their acknowledged apprentices, and the journeyman made his appearance. After a while the journeymen attempted to form guilds under the master crafts, as the latter had done under the merchant guilds; but the economic condition of the time beat them, and they failed. Still, the conditions of work did not change much; the masters were checked by laws in favor of the journeymen, and wages rather rose than fell all through the fifteenth century, nor did division of labor begin till much later. Everywhere the artisan was still an artist. The beginning of the great change came with the Tudors in the first quarter of the sixteenth century, during which England, from being a country of tillage cultivated for livelihood, became a grazing country farmed for profit. He who runs may read the tale of this change, and its miseries, in the writings of Moore and Latimer. It had a very direct influence on the conditions of life and manner of work of the artisans, for the crafts were now flooded by the crowds of landless men who had nothing but the force of their bodies to live on, and were obliged to sell that force day by day, for what those would give them who certainly would not buy labor unless they could make a profit by it. The brutal rapine with which the change of religion in England was carried out, the wanton destruction of our public buildings which accompanied the stealing of our public lands, doubtless played its part in degrading what art was still possible under the new conditions of labor. But the Reformation itself was only one of the aspects of the new spirit of the time produced by great economic changes, and which dealt with art and its creator, labor, far more completely than any series of accidents could do, however momentous they might be. The change in the condition of labor went on speedily, though there was still a good deal of domestic manufacture; the workmen in the towns got to be more dependent on their employers, more and more mere journeymen, and a great change was coming over the manner of their work. The mere collection of them into big workshops under one master in itself gave economy of space, rent, fuel, lighting, and the rest; but it was the prelude to a much greater change. Division of labor now began and rapidly gained head under the old mediæval conditions; the unit of labor was a master craftsman who knew his business from beginning to end. Such help as he had was from mere apprentices who were learning the business and were not doomed to life-long service.

With the new system of master and men came the change that the unit of production was a group, each member of which depended on every one of the others and was helpless without them. Under the division-of-labor system a man is very often condemned for the whole of his life to make the insignificant portion of an insignificant article of the market. The birth and growth of this division-of-labor system was no mere accident, was not the result and mean of some passing and inexplicable fashion which caused men to desire that kind of work which could be done by such means. It was caused by economical changes which forced men to produce no longer for a livelihood as they used to do, but for a profit. Almost all goods — all except those made in the most domestic way — had now to go through the market before they reached the user's hands. They were in fact made for sale, and not primarily for use; the art in them, as well as their mere obvious utility, was now become a marketable article, doled out according to the necessities of the capitalist, who employed both machine, workman and designer, fettered by the needs of profit. For by this time, instead of all workmen being artists as they once were, they were divided into workmen who were not artists and artists who were not workmen. This change was complete or nearly so by the middle of the eighteenth century. The gradual degradation of the arts from the fifteenth century to this point was steady and certain. Only among men who were more or less outside the great stream of civilization, where life was rude and production wholly domestic, did the article produced retain any signs of human pleasure; elsewhere pedantry reigned supreme. The picture-painters who were wont to show us, as through windows opened by them, the longings and lives of the saints and heroes, nay, the very heavens and city of God hanging over the earthly city of their love, "were turned" — what few of them were aught else than pretentious daubers — "into courtly flatterers of ill-favored fine ladies and stupid, supercilious lords."

As for the architectural arts, what could you expect to get of them from a set of human machines, co-operating, indeed, but only for speed and precision at reproduction, and designed for at best by pedants who despised the lives of men, and, at worst, by mechanical drudges, little better in any way than the luckless workmen! Whatever might be expected, nothing was got but that mass of foolish toys and costly ministrations to luxury and ostentation, which has since those days been most worthily continued under the name of upholstery

Is that the end of the story of the degradation of the arts? No; there is another act to the drama, worse or better, according to whether you are contented to accept it as final, or have been stimulated to discontent, that is, hope for something better. From being reduced to a machine, the workman was pushed down from even that giddy eminence of self-respect. At the close of the eighteenth century England was a country that manufactured among other countries that manufactured. Her manufactures were still secondary to her merely country life, and were mixed up with it. In fifty years all that was changed, and England was the manufacturing country of the world, the workshop of the world. This strange and most momentous revolution was brought about by the machinery which the chances and changes of the world forced on our population. Whereas under the eighteenth-century division of the labor system, a man was compelled to labor forever at a trifling piece of work in a base, mechanical way, under the system of the factory and almost automatic machines under which we now live, he may change his work often enough, he may be shifted from machine to machine, and scarcely know that he is producing anything at all. Under the eighteenth-century system he was reduced to a machine; under that of the present day he is the slave to a machine. It is the machine which bids him what to do on pain of death by starvation; if it please to hurry, it can make him walk thirty miles a day instead of twenty miles, and send him to the workhouse if he refuses. If you inquire which is the worse off, the machine workman of the eighteenth century or the slave-to-the-machine of the nineteenth century, I am bound to say that I think the former is; but the question as to which produced the better work is different and less complicated. The machine workman had to be well skilled in his contemptible task at least; the slave to the machine needs but little skill, and, as a matter of fact, his place has been taken by women and children, and what skill is needed in the work goes in the overlooking of the labors of the latter. In short, the present system of the factory and its dominating machine tends to doing away with skilled labor altogether. Hence there is a strange contrast between the craftsman of the Middle Ages and him of to-day. The mediæval

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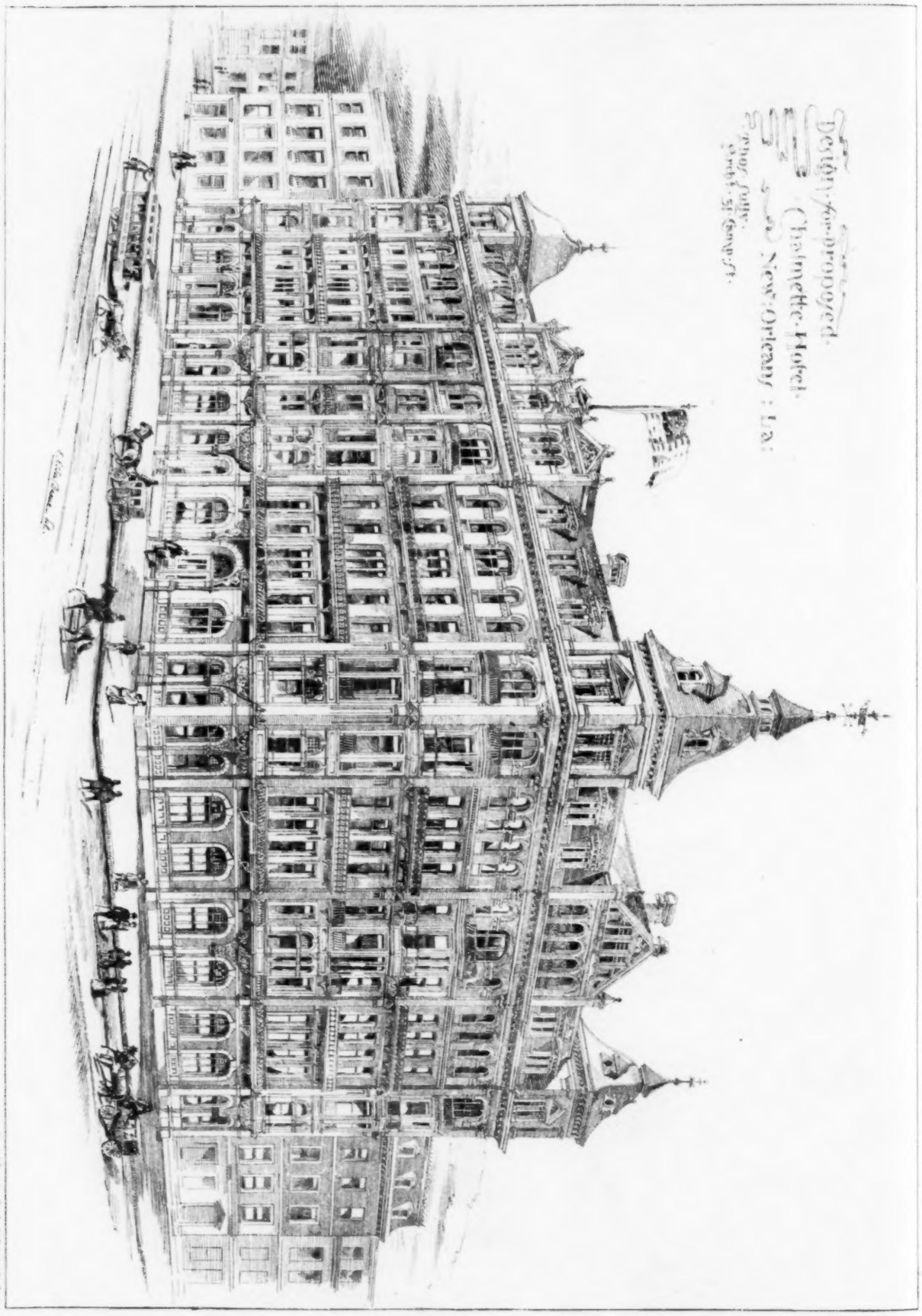

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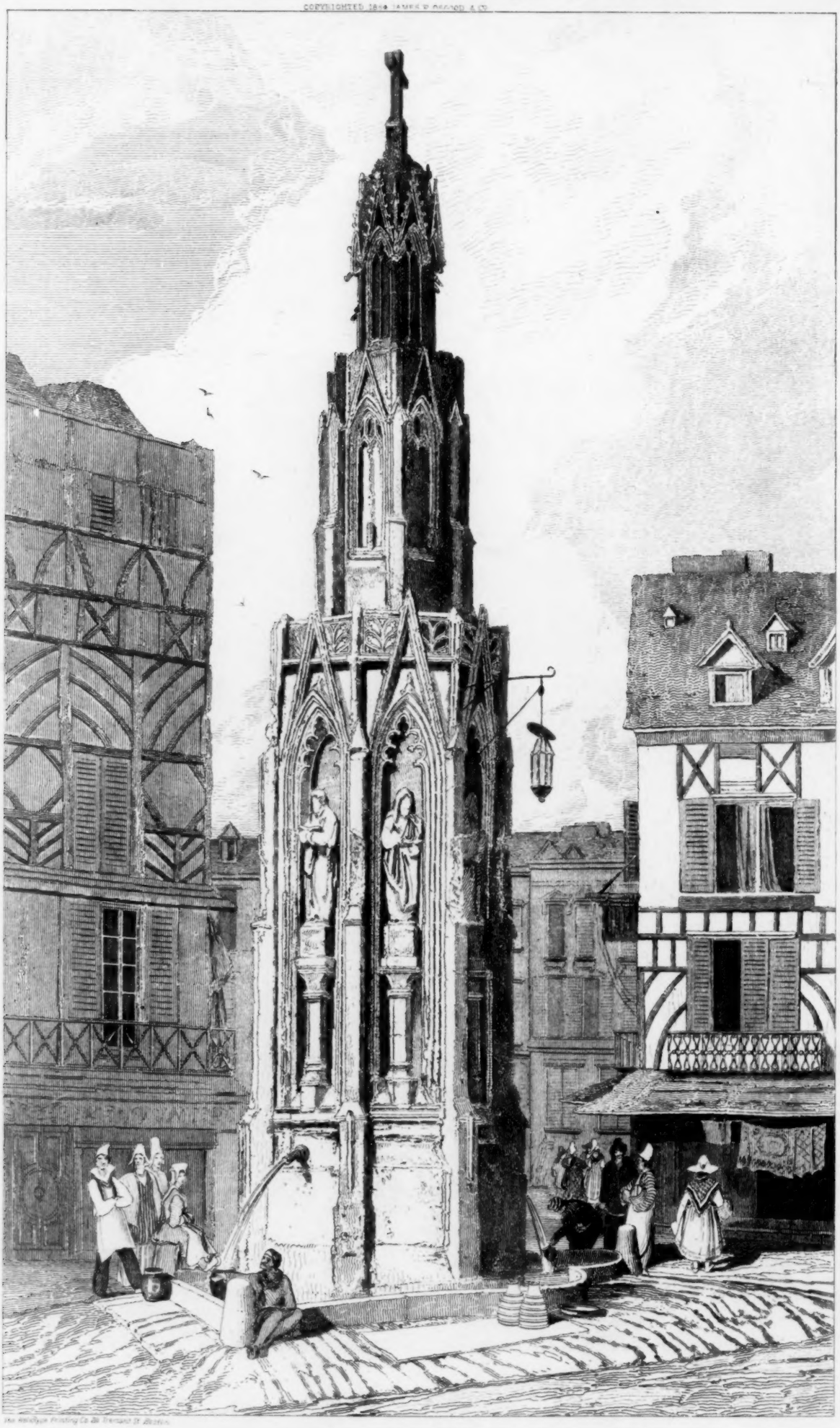

FOUNTAIN OF THE STONE CROSS AT ROUEN.

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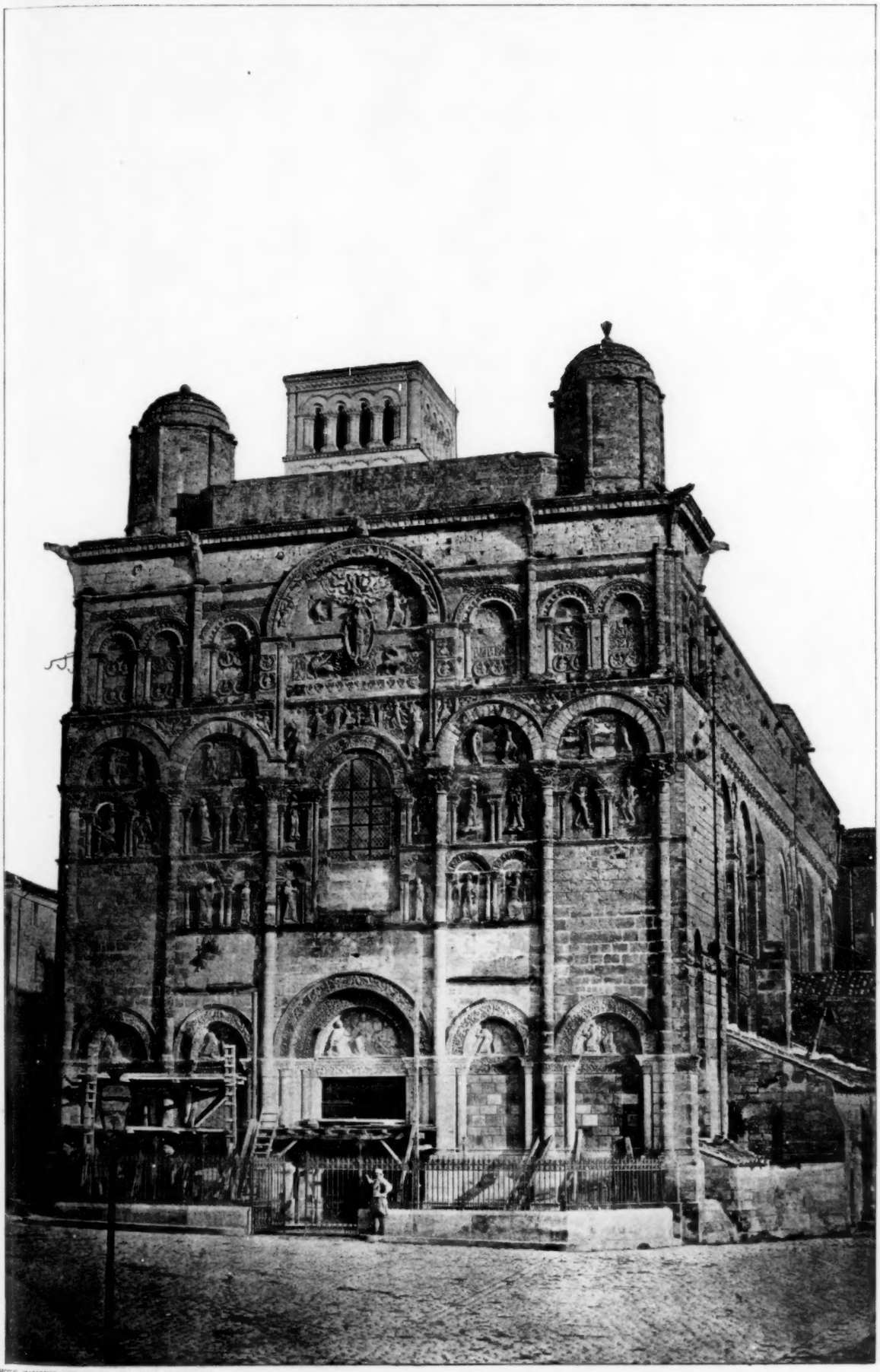

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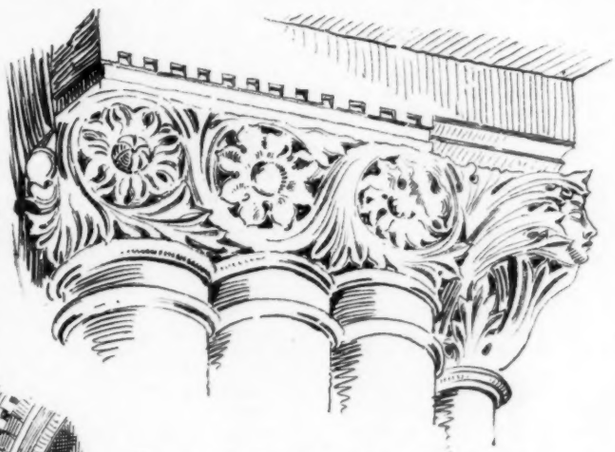
Details from the Ames Building: Bedford & Kingston Sts. Boston.

H. H. Richardson, Archt.



Carved Capitals in Entrance

Entrance on Bedford St.

Third Story Windows.

Sketched by C. Elton Beaux

The Heliotype Printing Co. 88 Tremont St. Boston.

man set to work in his own time, in his own house; probably made his tool, instrument, or simple machine himself, even before he began with his web or bundle of clay; what ornament there should be on the finished work he himself determined, and his mind and hand designed it and carried it out. Tradition in the concrete form of the custom of his craft guided and helped him, but otherwise he was free, and even if he lived in a town, the field and sweet country came close up to his house, and at times he occupied himself in working in them.

But how does he who has taken his place work and live? He has to be at the factory gates by the time the bell rings, or he is fined or sent to grass — nay, not always with the factory gate open to him. There before his machine, up and down he has to follow it, day in and day out, and what thought he has must be given to something else than his work. It is as much as he can do to know what the machine is doing; design and ornament, what has he to do with either? He may be tending a machine which is making a decent piece of work, or he may be a very small accomplice in turning out a blatant piece of knavery and imposture; for the one or the other he will get as much wages. He is lodged in a sweltering dog-hole, with miles and miles of similar dog-holes between him and the fair fields of the country, which in grim mockery is called "his." Sometimes, on holidays, he is bundled out by train to have a look at it, to be bundled into his grimy hell again in the evening.

At what period of a workingman's life, then, will you pick him up and set him to imitating the work of the free craft-guildsman of the fourteenth century, and expect him to turn out work like his in quality? Not to weaken my argument by exaggeration, I admit that though a huge quantity of would-be artistic work is done by this slave of the machine at the bidding of some market or other, the crafts relating to building have not reached that point in the industrial revolution. They are an example of my assertion that the eighteenth-century division-of-labor system still existed and worked side by side with the great factory and machine system. Yet here, too, the progress of the degradation is obvious enough, since the similar craftsmen of the eighteenth century still had lingering among them scraps of tradition from the times of art now lost; while now in those crafts the division-of-labor system has eaten deep, from the architect to the hodman, and moreover, the standard of excellence, so far from its bearing any relation to that of the free workman of the guilds, has sunk far below that of the man enslaved by division of labor in the eighteenth century, and is not a whit better than that of the shoddy maker of the great industries.

Surely it is a curious thing that while we are ready to laugh at the idea of the possibility of the Greek workman turning out a Gothic building, or a Gothic workman turning out a Greek one, we see nothing preposterous in the Victorian workman producing a Gothic one. And this, although we have any amount of specimens of work of the Renaissance period, whose workmen, under the pedantic and retrospective direction of the times, were theoretically supposed to be able to imitate the ancient classical work, but which imitation turned out obstinately characterized of their own period, and derived all the merit it had from those characteristics — perhaps of all the signs of the weakness of art at the present day the most discouraging. I may be told that the very historical knowledge of which I have already spoken, and which the pedantry of the Renaissance lacked, has enabled us to perform that miracle of raising the dead centuries to life again; but this is a strange view to take of historical knowledge and insight, that it should set us on the adventure of trying to retrace our steps towards the past, rather than give us some glimmer of insight into the future — a strange view of the continuity of history, that it should make us ignore the very changes which are the essence of that continuity.

The art of the past cycle of the Renaissance, which fluttered out in the feeble twaddle of the dilettantism of the later Georges, had about it a supercilious confidence which entirely forbade it to accept any institution of style but one as desirable, which one was that which it regarded as part of itself. It could make no more choice in style than could Greek or Gothic; it fully, if tacitly, admitted the evolution of history, accepted the division-of-labor workman, and so, indeed, did its best and had a kind of life about it, dreary as that life was, and expressive enough of the stupid but fearless middle-class domination which was the essence of the period. We, however, refuse to admit the evolution of history; we set our slave to the machine to do the work of the free mediæval workman, or of the man of the transition period, indifferently. We have learned the trick of masquerading in other men's left-off clothes, and carry on an hypocritical theatrical performance rather with timid stolidity than with haughty confidence, determined to shut our eyes to everything seriously disagreeable, nor heeding the silent movement of the history which is still going on around and underneath our raree show. Surely such a state of things is a token of change — of change, speedy perhaps, complete certainly — of the visible end of one cycle and the beginning of another. For, strange to say, here is a society which, on its cultivated surface, has no distinct characteristics of its own, but floats hither and thither; this set of winds drifting towards the beauty of the past, that towards the logic of the future. All the while underneath this cultivated surface works the great mediæval system which the cultivated look on as the servant and the bond of society, but which really is their master and the breaker-up of society; for it is in its essence a war, and can only change its character with its death; man against man, class against class, with this motive, "What I gain you lose," it must go on till the great change comes, whose end is peace, and not war.

In conclusion, Mr. Morris asked: What are we, we who are met together after seven years of humble striving for existence, for leave to do something? Mere straws on the ocean of half-conscious hypocrisy which is called "cultivated society?" I hope not. At least, we do not turn round on history and declare this is bad and that is good; I like this and I don't like that. Rather, we say: This was life, and these the works of our fathers are material signs of it. That life lives in you, though you have forgotten it; those material signs of it, though you do not heed them, will one day be sought for, and that necessity which is even now forming the society of the time to be, and shall one day make it manifest, has, amongst other things, forced us to do our best to treasure them, these tokens of life past and present. The society of to-day, anarchical as it is, is nevertheless forming a new order, which we, in common with all those who have the courage to accept the realities and reject shams, are and must be a part. In the long run our work, loveless as it must sometimes seem to us, will not be utterly lost.

After all, what is it that we are contending for? The reality of art: that is to say of the pleasure of the human race. The tendency of the commercial or competitive society, which has been developing for more than three centuries, has been toward the destruction of the pleasure of life; but that competitive society has at last developed itself so far that its own change and death is approaching, and as one token of the change, the destruction of the pleasure of life is beginning to seem to many no longer a necessity, but a thing to be striven against. On the genuineness and reality of that hope, the reason for existence of this Society depends. It will not be possible for a small knot of cultivated people to keep alive an interest in the art and records of the past amidst the present conditions of a sordid and heart-breaking struggle for existence for the many, and a languid sauntering through life for the few. But when society is so reconstructed that all citizens will have a chance of leading a life made up of due leisure and reasonable then will all society, and not "our" Society only, resolve to protect ancient buildings from all damage, wanton and accidental, for then at last they will begin to understand that they are part of their present lives, a part of themselves. That will come when the time is ripe for it. At present, even if they knew of their loss they could not prevent it, since they are living in a state of war, *i. e.*, of blind waste. Surely we of this Society have had this truth driven home practically often enough; have often had to confess that if the destruction or "beautification" of an ancient monument of art or history was a matter of money, it was hopeless stirring. Let us admit that we are living in the time of barbarism betwixt two periods of order — the order of the past and the order of the future. Then, though there may be some of us who think (as I do) that the end of that barbarism is drawing near, and others that it is far distant, yet we can both of us work together to preserve what relics of the old order are yet left to us for the instruction, the pleasure, and the hope of the new. So may the times of present change prove less disastrous, if but a little, the times of coming be more fruitful.

THE ILLUSTRATIONS.

FOUNTAIN OF THE STONE CROSS AT ROUEN.[1]

ROUEN has long boasted a pre-eminence over the greater part of the cities of France with respect to its public fountains. The chalk hills, with which it is surrounded, furnish an abundant supply of excellent springs, and the waters of these, led into different parts of the town, contribute in no less a degree to the embellishment of the city than to the comfort of the inhabitants. The form of some, and the ornaments of others are well deserving of attention, notwithstanding the injuries that have inevitably occurred from time to time, or the more cruel ones that have been caused by wanton mutilation. It is upon the historical record that there were several fountains at Rouen as early as the twelfth century, but their number which now exceeds thirty, received its principal increase towards the beginning of the sixteenth century, and it was then also that the idea seems to have been conceived of making what was originally designed only for convenience subservient to beauty. For this new supply of ornamental fountains Rouen is indebted to its great benefactor, the Cardinal Georges d'Amboise, who, uniting the Norman archiepiscopal mitre to the office of prime minister, under Louis XII, was no less able than he was willing to render the most essential services to the seat of his spiritual jurisdiction. It was under the auspices of this archbishop that the fountain here figured, one of the earliest of that period, was erected. He caused it to be built in the year 1500. The spot which it occupies is the cross-way formed by the union of the streets called St. Vivien, St. Hilaire and Coqueraumont, a spot which, previously to the reign of St. Louis, was not included within the walls of the town, and which even at the distance of one hundred years after that time had not begun to be inhabited. So ancient is the habit of placing stone crosses at the junction of roads in the vicinity of cities that it would be difficult to assign any probable time for the erection of that which was replaced by the fountain that still bears its name. The waters of this fountain have their origin in a spring which flows at the foot of a hill near the village of St. Léger, at some distance from Rouen. The execution of the structure unites a happy mixture of boldness in outline, and delicacy in details; its pyramidal

[1] From Cotman's "*Architectural Antiquities of Normandy.*"

form is graceful. It consists of three stories, gradually diminishing in height and diameter as they rise, and terminating in a cross, whose clumsy shape only renders the destruction of that which it replaces the more to be regretted. The form is octagonal throughout, and upon every compartment in each of the stories is carved, at a short distance from its base, a narrow cinquefoil-headed arch, surmounted by a triangular crocketted canopy; but the crockets and finials have been in most instances destroyed. The water issues from four pipes in the basement. Each of the arches in the lower tier serves as a tabernacle for a wooden statue of a Madonna or saint, of wretched execution, a poor substitute for those that occupied the same niches previously to the troubles of 1792, at which time the religious character of the fountain marked it out as an object of popular vengeance. It was suffered to continue in its mutilated and degraded state from that period till the year 1816, when the inhabitants of this part of the town undertook to restore it at their own expense. Their labors have hitherto proceeded no farther than filling the niches afresh with images, and doing such repairs as were absolutely necessary to keep the whole structure from falling into ruin. Even by this, however, they secured for themselves the good will of the archbishop, who consecrated the fountain with great pomp anew on the 24th of August, 1816. The resemblance between the Fountain of the Stone Cross at Rouen and the monumental crosses erected in England by Edward I, to perpetuate the memory of his consort, Eleanor of Castille, will not fail to strike the British antiquary. It is more than probable the idea of the former was borrowed from the latter, to which, however, it is very inferior in point of richness of ornament, or beauty of execution.

DESIGN FOR THE CHALMETTE HOTEL, NEW ORLEANS, LA. MR. THOMAS SULLY, ARCHITECT, NEW ORLEANS, LA.

DETAILS FROM THE AMES BUILDING, BOSTON, MASS. MR. H. H. RICHARDSON, ARCHITECT, BROOKLINE, MASS.

This is one of the most noteworthy buildings devoted to mercantile purposes that have been built in any part of the country, and it is a great misfortune that it is placed at the junction of two of the narrowest streets in the city, where it is impossible to get a satisfactory view of it as a whole. Nevertheless, visitors to Boston should not fail to hunt it up.

EGLISE DE ST. PIERRE, ANGOULÊME, FRANCE.

The cathedral church of St. Pierre is considered one of the latest examples of Romanesque in the southwest of France, dating from the last part of the eleventh and the first part of the twelfth centuries. The striking peculiarity of the building is that the nave is, like some other churches in the south of France, covered by stone domes. We are not sure whether these domes are visible from the outside or whether they are covered, as at Perigueux in the case of St. Front, by a wooden roof. Another peculiarity is the shortening of the transepts so as to give room for but one shallow bay on each side, the exterior effect being preserved by the erection of a tower at the end of each transept.

THE MANUFACTORY OF PORCELAIN AT SÈVRES.

From the OLD HOTEL DE VILLE. PARIS.

The birth of the porcelain factory, now so grandly located at Sèvres, just inside the park gates, may be said to have been very humble, and took place at Vincennes. From the commencement of the eighteenth century works had existed at St. Cloud, and other places; but a great deal of porcelain was imported from Meissen, near Dresden, in Germany, and it was in rivalry to this that the desire arose to extend the manufacture in France. Accordingly, in 1745, a sort of company was established at Vincennes, nominally under Charles Adam, which obtained from the government the exclusive privilege of production for thirty years. It consisted of some eight or ten members, all workmen: one Gravant made the clay; the sieur Caillat supplied the colors; and Hippolyte, of S. Martin des Champs, the gold. In 1746, their numbers were added to, and the services of the celebrated chemist Hellot helped to add to the success of the undertaking. A curious document in the Archives shows the importance of the affair in 1750, giving as the staff of the establishment, a director, Boileau Duplessis, goldsmith to the king, designer; Bachelier, director of the art department; three modelling sculptors; two throwers; three designers; five turners; two chemists; eighteen painters; five burnishers; and twenty-six *répareurs*. Certain privileges were accorded them, but on the other hand they were bound not to divulge their secrets elsewhere. This, however, did not prevent the manufacture of spurious specimens, and various means were adopted to put an end to the fraudulent productions; but to so little effect that in 1752, the authorities being tired of the inability of Adam to manage the affair, revoked his charter, and gave the direction to Eloy Brichard, obliging him to mark all the objects turned out of the factory, with a double L interlaced thus ⅄ (The first known marked specimen is dated 1753).

The next year, 1753, Louis XV began to interest himself in the matter, and the factory took the name of "Manufacture Royale de Porcelaine de France:" an initial letter being adopted to fix the date of the year. In 1754, the Empress of Russia ordered the celebrated service imitated from antique camei, which led to so much correspondence between the ministers of the two countries. It is ludicrous to find an empress haggling over the price of 360,000 *f.*, which Bertier on his side assures her, is a most moderate sum for such a wondrous work of art.

At this time so great was the number of orders, that the old premises were found to be quite inadequate for the work, and a piece of ground was obtained at Sèvres, where formerly stood Sully's house. Here an enormous structure was erected, which was thought to be large enough for all time; but some years ago, this in its turn was found to be too small, and the new buildings at the lower part of the park of St. Cloud, close to Sèvres, were constructed. The situation of the old *fabric* was very picturesque. Upon a hill to the left of the route de Versailles, dominating the town, and approached by an embanked road, passing over what once was a stream, but is now converted into market-gardens, the old buildings with its high-pitched roof has the appearance of an eighteenth century château. Within the court-yard is a fine old well built into the wall, and overgrown with ivy and wild flowers.

The new director was no more fortunate than his predecessor. Spurious Sèvres continued to be produced, and unable to combat with the fraud, he was ruined, like Charles Adam: so in 1759, the whole affair was reorganized. It was put under the administration of the king; Barbirie de Courteille, Councillor of State, being at the head of it, but Boileau remaining the director. At the same time more vigorous measures were taken to prevent forgery, and heavy fines were levied upon the offenders; in fact, so rigorous were the new laws that they practically revoked the charters of the factories already established, such as Mennecy, Chantilly, and Sceaux, and prevented any new ones from being founded. Naturally the outcry was great, and a modification of the laws had to be arranged, allowing persons to continue the productions at their factories, provided they marked them, and abstained from using gold and other colors than blue; and from making statuettes or flowers in biscuit, in relief upon vases. Forgeries of the Sèvres mark were made punishable by a fine of 3000 *fs.*

All the productions of this period had been in the "*pâte tendre*" or soft paste, and no doubt this is by far the most beautiful porcelain ever produced; but in 1753, a native of Strasburg named Paul Hannong, intimated to Boileau that he had discovered a clay that would make "*pâte dure*" as well as that of Meissen. This offer came very opportunely; for some time past, the ministers had desired to rival Germany in this product, and so prevent the importation of "Porcelaine de Saxe;" but upon investigation of the matter, no faith was placed in the discovery, and Hannong entered into an agreement with the Elector Palatine to found the manufactory of Frankenthal. In 1761, we find the affair again being discussed, and communications addressed to the second son of Hannong, Pierre Antoine, who was director of one of the Lorraine factories; and an agreement was made between him and M. Bertier for the acquisition of the "*pâte dure*." Again failure ensued, the principal substance was wanting, and all parties were content in 1765 to cancel the agreement, Hannong receiving compensation and a pension. In the same year, a paper was read to the Academy of Sciences by one Guettard upon the subject, in which he asserted that a kaolin similar to that of China, had been discovered in France, in the neighborhood of Alençon. This statement was verified, but disputes ensuing nothing was definitely arranged until 1768, when a surgeon of St. Yrieis la Perche, named Daruet really found the requisite earth, and in 1769, the manufacture of the hard paste was regularly established, from which date the two kinds of porcelain were manufactured simultaneously. This was the best period of production (1770–78) when Reynier was director, and amongst the artists were Falconnet, Clodion, La Rue, Boizot, Bachelier, and Duplessis. This is proved by the vases bearing the names of "*Le Falconnet*," "*Le Milieu du Roi*," "*L'Ecritoire*," "*La Fontaine Dubarry*," and "*La Rue*," which were all of exquisite design. The last named was surmounted by a narrow neck, and held up by two Tritons forming a foot: while the vases of Clodion were all a marvel of elaborate design and color, embellished with gold.

Louis XVI endeavored to simplify the taste of the day, as for example, in his vase called "*l'œuf garni*," which is nothing but a medallion portrait of the king, surmounted by a garland, which is attached to the bottom of the handle, in the "*Urnes Grecques pures*," and in the "*Vase Medicis*," with its antique Bacchanal and acanthus-leaf decorations.

The gradual development of the national taste in France, can be studied in the Museum from the various exhibited specimens. Beginning with a close imitation of the German, pastoral subjects by Boucher and his school became the fashion — "Fishing," "Flute Players," "Breakfast," "Toilette," "The Nurse," — all such domestic events treated in the sentimental style prevalent at the end of the last century; fine ladies personifying shepherdesses, and courtly gentlemen simple peasants, "Chloe and Daphne," etc. Illustrations from La Fontaine's fables, and Don Quixote also became popular.

To this succeeded a grander style. Falconnet, whose "*Baigneuse*" opened the doors of the Academy to him, made a reduced copy of it, and a pendant, "*Baigneuse aux Roseaux.*" His "*Garde à vous*" served as the principal motive of a splendid vase — a pedestal supporting a medallion, surrounded with garlands, and crowned by the base of a column on which reposes a child. This is a worthy introduction to the "*surtouts*" — half vases and half sculptured groups, such as the "Bacchus," and others. Animals also were much in vogue, wolves, boars, dogs, etc.

Amongst the child-subjects modelled by La Rue, some were original, some were from drawings by Boucher. It is difficult to give any idea in writing of the exquisite modelling of the flowers on these vases, but a few specimens of those originally made at Vincennes, and afterwards at Sèvres, can be studied in the Museum. Double anemones, ranunculuses, orange flowers, and others, remain from the crash which took place at the end of the last century. During the Revolutionary period a false simplicity was forced upon the factory, partly by the withdrawal of State aid, and partly to pander to the mad taste of the day. Thus we find designs in which red, white and blue stripes figure with or round Phrygian caps; "Equality Triangles," and "*Couteaux niveleurs*," and the most wonderful conceit of all, the Balloon-Ascent series. A large collection of these latter, by the way, can be seen at the Hôtel Carnavalet, where there is an exhibition of various curious things appertaining to the great Revolution.

With the nineteenth century began what is called at Sèvres, the "Reign of the Architects." Percier and Brongniart introduced vases in the Egyptian and Greek style; furniture was decorated with innumerable medallions; busts the size of life were made as a *tour de force* to show what could be done with the "*pâte dure*," and later on (1820), Chenavard introduced an ornamental style borrowed from the Renaissance.

Previous to this, at the end of the eighteenth century, the manufacture was discontinued for a time, suffering the usual fate of all peaceful arts when a nation has the fever of war upon it; but it was owing to this cause, that so many fine specimens of the "*pâte tendre*" found their way into England. At first, being a very costly product, it was only made for Royalty, or sold (by permission) at very high prices; the cost of good specimens at that period being little less than they are purchased for now, allowing for the change in the value of money. The general panic which succeeded the great Revolution and the turmoil of the early years of the First Empire, so reduced the value in France, that exportation began to be practised. English noblemen debarred from travelling, and so collecting treasures from all parts of Europe, bought up all they could find at home; while the exiled nobility of France were only to glad to find purchasers for their valuables — furniture, porcelain, etc. — for by these means they were able for a time to tide over their financial difficulties. Moreover the personal tastes of the Prince Regent of England (George IV), favored this development of taste for *objets d'art*, he was not only an artist in millinery and tailoring, but had a genuine love of art, and the formation of the magnificent collection now belonging to Queen Victoria is due to him. Smuggling also took place to a great extent, one Benoit managing to voyage to and fro between France and England, in spite of the dangers consequent upon war; running the blockade and eluding custom-house officers, with a shipful of treasures which he sold to London dealers. From them George IV and his friends purchased, knowing little and caring less about the circumstances under which the things were acquired; and it is doubtless owing to these facts that the pseudo-classical style of decoration was introduced into England; for, in spite of the hatred of Napoleon and the French nation in general, the English adopted their taste in matters of art, though they opposed them in those of dress and fashion.

The manufacture of the old soft paste was a much more difficult process than that of the hard; greater risk was incurred in the firing, and therefore the old specimens were of comparatively small dimensions. It is an artificial substance of purely chemical composition, differing in this respect from the Sèvres and Oriental hard pastes, which are composed of natural minerals. Being very soft and vitreous, it can be entirely melted in the fire at a very high temperature, which is impossible with the "*pâte dure.*" Again the superadded glaze is also softer and richer than that which covers the hard body, it melts into the paste to a certain extent, forming a most beautiful surface; and when the colors are laid upon it, there is a general blending of the tones which gives a most lustrous and brilliant effect to it, indeed the decoration of old Sèvres is not unlike the impasto of a rich oil painting in its depth and warmth of tone.

The more modern hard-paste porcelain is easily distinguished from the old soft paste. It has a crude and thin effect; the colors, instead of being "*empaté et gouaché*," *i. e.*, laid on thickly, and like a tempera painting, are painted on like a miniature, washed and stippled, and the whites left. Even the ware itself has a cold blueish tinge, while the hardness of the glaze prevents any mingling of the colors, so that they rest upon the surface, in some parts appearing rough and dull, while in others they present a highly varnished appearance. The process of fabricating the "*Bleu du Roi*," or turquoise blue (*pâte tendre*), was in this fashion: the color was made into a paste, and laid on the biscuit with a steel spatula; put into the oven it came out wavy and mottled; it was then rubbed down with pumice-stone, a second coat of paint was laid on, and it was re-fired and re-polished; if the color was considered good, it was fired a third time. Violet was treated in the same way, and this process is carried out at the present day; violet specimens of the old period are, however, very rare, and two at the Museum were bought for, and considered for a long time to be Chinese. The colors employed were violet (*pensée*), which rivalled the Oriental in velvety quality, and depth of tone; light yellow (*jonquille*), apple-green; and red (*rouge de fer*), which looks well in mountings of ormoulu. But the most beautiful are the *bleu du Roi* (turquoise) and *rose du Barry*.

With regard to designs the old Sèvres differs from Saxe (or Dresden) as a picture by Boucher or Watteau differs from a Cranach or Abraham Mignon. A plaque in the museum, made in 1750, of a subject after Desportes, is perfect in detail, and yet the harmony and softness are as remarkable as in the original picture. Boucher's "*Diane au Bain*" in the Louvre was a favorite subject; we find it on a plaque belonging to the Baroness James de Rothschild, and upon many vases. Dodin's "*Triomphe de la Beauté*" was made in 1777; Pithou's "*Toilette de la Sultane*" in 1783. The smaller objects of this period (1760–80) had projecting borders festooned in a sort of tooth ornament, painted blue or purplish-red. Later the colors were multiplied, and the dental border was replaced by various colored ribands surrounding a garland or band of arabesques. Amongst the most beautiful specimens are those of the *rose de Barry* color, a beautiful warm yellowish pink, named after Madame de Pompadour, whose favorite color it was, and who took a great interest in the factory, and perhaps from the fact of her having a palace on the adjacent hill of Bellevue.

The "*pâte dure*" was not much developed until the revolutionary period, when economic reasons weighed with the difficulties of producing the "*pâtre tendre.*" With the advent of M. Alexandre Brongniart to the directorship of the factory an entire change took place. took place. Being exclusively a scientific man he paid more attention to the technical excellence of the paste than to its artistic beauty, consequently all his energies were directed to the perfecting of what he considered the only true porcelain—the "*pâte dure.*" Again the decorative taste of the day favored his views, for the hard, dry classicalism of the Empire had given place to the Boucher style, which, as we have said, lent itself so completely and harmonized so well with the "*pâte tendre.*"

The largest vases produced under the directorship of M. Brongniart are those in one of the old rooms of the Louvre (facing St. Germain l'Auxerrois) of a tortoise-shell ground, and one at Sèvres representing the arrival of the loot from the Italian campaign by Napoleon Bonaparte, which was only finished in 1815. It was painted by Béranger, and being to the "*Gloire de la France,*" Louis XVIII exhibited it publicly, and gave M. Brongniart the *croix d'honneur.* M. Brongniart remained at the head of the factory until some years ago, and it is only since his death that any revival of the soft paste has taken place; indeed, for some years it was almost a lost art.

As to the marks. In 1753, as we have said, it became compulsory to put the double L and a numerical letter. Thus each year from 1753–77 is dated by a letter of the alphabet — 1753 A, 1754 B, and so on. In 1778 double letters (1778 AA, 1779 BB) were used, which continued up to 1792 (OO). From that year until 1800 the date of the year is always wanting. With 1801 began a new system, as follows: —

An IX	(1801)	ꝺ
X	(1802)	X
XI	(1803)	ıı
XII	(1804)	-ıı-
XIII	(1805)	↑
XIV	(1806)	=
	1807	7
	1808	8
	1809	9
	1810	10
	1811	ox
	1812	ꝺ3
	1813	ꝺ3
	1814	qz
	1815	qn
	1816	fu (ꝺ3)
	1817	ds
	1818	18

This system is continued at the present day.

The monogram changed in 1792 from the LL to RF or R. F. placed above Sèvres. This lasted until 1799, when Sèvres remained alone. About 1803 "*Manufacture Nationale*" was introduced, thus: M. N$^{le}_{=}$ Sèvres -ıı- This giving place from 1804–9, to: M. Imp$^{le}_{=}$ de Sèvres =; and after that date to the Imperial Eagle. In 1814 the interlaced Ls reappeared with a *fleur-de-lys* in the middle and Sèvres at the bottom. Charles X (1824–27) introduced two C's crossed with an X in the centre, and a *fleur-de-lys* below. These in their turn disappeared, and the *fleur-de-lys* alone took their place, Sèvres always being at the bottom with the date. 1830–34 a stamp with a circular riband bearing a star was introduced; from 1834–48 we find L P with a crown above; then we arrive at another R F succeeded by the eagle and N with a crown above it.

Since An. IX (1801) white pieces have been dated thus, Jan. 1, Feb. 2, and so on. Since 1833 a green line with the letter S and the letters of the year have been substituted. Collectors should beware of false Sèvres, which is sometimes fraudulently marked; but the connoisseur can easily discover it, as the mark of a landscape painter is frequently put under a figure subject, and that of a flower painter

under a landscape. Every artist entering the workshops has a mark assigned to him, and sometimes the Director, in very bad taste and questionable wit apportions an "appropriate" one, as, for example, Pouillot, a confirmed drunkard, received the mark of a pot; Aubert (an old wigmaker) a pigtail; the musician Chulot, two quavers; Evans (from the army) a sword; the gilder, Vincent, 2000; Dieu, a triangle (the emblem of Jehovah).

And now a few words as to the Museum. The arrangement followed is that planned by Brongniart in his "*Description Méthodique du Musée céramique de Sèvres,*" an illustrated catalogue of the year 1845. The classification is terra-cotta; antique lustrous vases; glazed Middle Age wares; enamelled ware of the Renaissance and modern porcelain. These classes are all subdivided into nationalities and epochs, and the whole affords a methodical encyclopedia of ceramic art, which can be read by the simplest minds, for each object is labelled with full details. The actual arrangement was carried out by M. Champfleury.

The first cases contain Egyptian, Phœnecian and Archaïc Greek; unglazed potteries, which are little superior to the Peruvian of modern times. Then comes the Greek period, about 300 B. C, which, however, can be better studied at the Louvre. A strange series of vases from Gnatia (Apulia) follows: black grounds, garlands of flowers, and marks in yellowish-white and orange-red. The succeeding cases contain Celtic, Gallic and Gallo-Roman glazed or unglazed wares; Roman ditto; unglazed pottery from seventh to sixteenth centuries found in France, being mostly black with geometrical patterns during the Merovingian and Carlovingian times and red later on. Peruvian, Mexican, Polynesian and Indian pottery are also represented. At the end of these cases we come to some large specimens of faïence; a Virgin and child by Andrea della Robbia, white-glazed; a large green-glazed German stove, and another made by Ollivier in the Fauberg St. Antoine during the Convention—a brown-enamelled model of the Bastille. The Italian process of encrusting one color upon another producing a rich glazed surface was adopted by the French for paving-tiles, but the only examples which remain are some fragments of the twelfth, thirteenth and fourteenth centuries. The former are black *fleur-de-lys* upon a red ground. The fashion which came in during the Middle Ages of making vessels for table use of metals contributed much to prevent the advance in the making of pottery, which might otherwise have taken place. A curious "*broc*" (drinking-mug), with a human face (fifteenth-century), is supposed to be a caricature of an Englishman — a protest by some Parisian *modeleur* against the English occupation.

The following cases contain specimens of glazed pottery, sixteenth and eighteenth centuries, those in relief from Manerbe and Beauvais; the products of Chapelle-de-Pots, Saintonge and Palissey; Italian, German and Spanish wares. The "*Vase électuaire,*" with the arms of the town of Milan and the Medici, is a specimen of decoration engraved by the "slip" (*engobe*) process. This is called "sgraffiato" ware, and it is made as follows: A white earth of the nature of pipe-clay is milled with water, and passed over the coarser ware, dried and fired, when a design is scratched upon the surface — the picture thus being dark upon a white ground — after which it is again fired. One case is filled with fragments found in the Cour de Carrousel, a plaque ("Baptism of Christ") found in the garden of the Tuileries, and a plaster mould from the *atelier* of the Tuileries, where Bernard Palissey worked. Amongst French wares are Nevers, Rouen, Marseilles, Moustier, Clermont, Ferraud, Paris, St. Cloud, Bourg-la-Reine, Sceaux, Lille, St. Clément, Aprey, Strasbourg, Niederwiller and a number of secondary fabrications. Foreign wares are represented by Delft, Bruxelles, Marienberg, Rostrand and other manufactories in Germany, Spain and Portugal. Amongst the soft-paste examples are those of Capo di Monte, Chelsea, Worcester, Derby, Talavera, Vincennes and Sèvres. Hard-paste examples from China and Japan are numerous, as also from Meissen, Switzerland, Belgium and Sweden. Specimens also of Persian ware and biscuit.

The museum also contains the earths employed in different countries; specimens in different stages of fabrication; defective specimens and suggestions as to remedies. The excessive thinness of the egg-shell porcelain is obtained by putting the paste into thick plaster moulds, which absorb all the water from the clay.

A large collection of works reproduced from celebrated pictures can also be seen in the Museum, amongst which are the "School of Athens," "Deliverance of St. Peter," "La Maitresse de Titian," etc., but these and later productions (they all date since 1813) are wanting in the taste displayed in the works of the last century.

Sèvres possesses all varieties of colors (*au grand feu*) except orange-red and deep yellow. The blue used is oxide of cobalt, which, when calcined with oxide of zinc, verges towards violet, and likewise oxide of manganese turns to green; *oxide d'urane* gives yellow (and black according as the baking is oxidizing or not); red is a combination of tin and chrome — stannate oxide of chrome — or aluminate of chrome, which is an artificial ruby. Black is iridium oxide or "ruthéneum;" gray, platina in powder.

Let me advise all persons visiting Sèvres, to take sufficient time thoroughly to see the Museum, and not be content with passing through the factory, where little is shown but "throwing" and "firing." A few hours can also he spent delightfully in the woods hard by, where visitors can wander for miles, gathering wild flowers and listening to singing birds — little heeding that they are only four miles from the great city, — one hour by boat. S. Beale.

SOOT-PREVENTING.

El Paso, Tex., August 4, 1884.

To the Editors of the American Architect: —

Gentlemen, — Is there any remedy against "soot" being formed, caused from burning coal? It seems to me that I saw a remedy in your paper once to prevent it, but I cannot now find it. It was some metal, I believe. By giving an answer in your paper you will oblige,

Yours respectfully, Texas.

[The formation of soot can be avoided by using a smoke-preventing stove, furnace or fireplace. Of smoke-consuming furnaces several kinds are now in use here, particularly in Cincinnati and Chicago, and with care are said to work well. Smoke-consuming fireplaces are as yet, we believe, only to be had in England, where they are just now quite in fashion. If this is what "Texas" wishes, we will find the addresses of the principal manufacturers. There is no difficulty in importing English goods of the kind directly.—Eds. American Architect.]

PARTY-WALLS.

Albany, N. Y., August 11, 1884.

To the Editors of the American Architect: —

Dear Sirs, — Will you please inform me what works there are in relation to the rights and liabilities of owners of *party-walls,* and oblige, Yours very truly, F.

[We know of no American work on the subject. The best way to get the information "F" wants would be to look over the reports of cases, which he can find in any law-library, remembering, however, that what is law for New York is not necessarily good law in Pennsylvania, and *vice versa.* There are not many cases of the kind, party-walls being in this country almost always built under a private agreement, the parties to which restrict themselves in any way they may see fit, and invoke the assistance of the courts only to explain doubtful points or supply omissions. — Eds. American Architect.]

A FRENCH ARCHITECTURAL JOURNAL.

Des Moines, Io., August 16, 1884.

To the Editors of the American Architect: —

Dear Sirs,—Your inquirer "H," of Hartford, will find "*Le Recueil d'Architecture*" what he desires from France. It is from the press of the great *Ecole Centrale,* prepared that the co-working corps may understand the architecture they are to come in contact with in actual service. It is, therefore, devoted entirely to the present. Such works should be found in every state library, at least, throughout this country. C. T.

THE EQUILIBRIUM OF AN ARCH.

Boston, July 30, 1884.

To the Editors of the American Architect: —

Dear Sirs, — As I am required to determine the equilibrium of an arch I have referred to my volume of the *American Architect,* and find in Vol. X, No. 288, July 2, 1881, a diagram and its process in print. At the end of the nineteenth line it says, "Multiply the weight at v_1 by the distance $c_1 v_1$, and divide the product by the sum of the two weights; the quotient will be the distance $c_1 C_1$." It does not state whether the quotient will be in feet, inches or in feet and decimals. Please explain in your next issue these points referred to, and state what scale that "Diagram" was drawn.

Very respectfully yours, Student.

[1. The quotient will, of course, be of the same denomination as the distance $c_1 v_1$. It may be feet and inches, feet and decimals, inches only and fractions thereof, or metres, etc.

2. The diagram is reduced from a drawing considerably larger, and is, I suppose, to no particular scale. The radius is ten feet.—C. B.]

FURRING ON BRICK WALLS.

Saratoga Springs, N. Y., August 14, 1884.

To the Editors of the American Architect: —

Dear Sirs, — Will you kindly give me space in the columns of your valuable journal for the answer to the following: —

Would an isolated brick house be made any warmer by being furred off for inside plastering with three-inch strips instead of one-inch strips? By answering in your next issue (if possible) you will oblige,

Subscriber.

[The three-inch furring would be, if anything, less effective in keeping the house warm than one-inch furring, as it would allow more circulation in the air enclosed between the brick wall and the plastering, and consequently a more rapid transfer, by convection, of warmth from the inside to the outside of the air-space. If it is desired to make any furring as effective as possible, a good deal may be done by filling in the air-space, between the laths and the wall, with some light substance, which will entangle the air, and prevent it from moving freely. Cotton-wool which is very light, and elastic enough to keep its place, would be the best substance if it were not for the risk of fire. Mineral wool does reasonably well, but is heavy, and settles very much, unless kept up by wires or cross pieces of wood. Sawdust or tan bark are objectionable, as they settle to the bottom, absorb the moisture condensed on the inner surface of the brick wall and rot. Next to such filling as this, the best resource is the cutting off of the air-spaces between the furring strips by horizontal barriers at intervals. For this wooden strips may be used, but much the best material is mortar, which should be put on in horizontal bands, four or five inches wide, behind the places where the base-boards or wainscot will come, so that there may be no danger of the plastered walls being stained by dampness conducted across the air-space by them. The mortar should be put on just before lathing, the thickness of the furring, and the laths can be laid directly on it. When the inside plastering is put on these, it will be pressed through and unite with the mortar strip. The belts of mortar should be continued all around the house, and there may with advantage be one in each story.—Eds. American Architect.]

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

303,276. FIXING COLORS OR DESIGNS IN WOOD, MARBLE, ETC. — Geo. Hand Smith, London, County of Middlesex, Eng.

303,277. APPARATUS FOR THE MANUFACTURE OF WHITE LEAD. — George Hand Smith, London, County of Middlesex, Eng.

303,278. MANUFACTURE OF WHITE LEAD.—George Hand Smith, Rochester, N. Y.

303,288. COMBINED CHIMNEY AND VENTILATOR. — Allen Stamper Jackson, Kohomo, Ind.

303,299. BENCH-VISE. — Mortimer G. Lewis, Lowville, N. Y.

303,303. COUNTERSINKING DEVICE.—Edwin Laselle Mansfield, Boston, Mass.

303,320. MITER-BOX.—William J. Powell, Marshfield, Mass.

303,324. HYDRAULIC ELEVATOR.—Jacob Schinneller, Pittsburg, Pa.

303,330. PAINT.—John A Shephard, Wooster, O.

303,334. REMOVABLE FLOORING FOR STALLS.—Myron Southwick, Peshtigo, Wis.

303,336. HEATING-STOVE.—Benjamin F. Stockford, Sturgis, Mich.

303,337. FIRE-ESCAPE.—Josh. C. Stoddard, Springfield, Mass.

303,338. BENCH-PLANE. — John F. Taber and William F. Gibbs, Clarion, Io.

303,339-340. PUMP.—Morris D. Temple, Chicago, Ill.

303,345. VISE ATTACHMENT.—William Vanderman, Willimantic, Conn.

303,356. MOLDING OR OTHER IRREGULAR SURFACE. —Frederick Beck, New York, N. Y.

303,359. MOSAIC OF GLASS AND LEAD GLAZING. — Henry F. Belcher, Irvington, N. J.

303,367. FIRE-ALARM. — Robert Durr, Milwaukee, Wis.

303,368. DRILL-GAGE.—Abel G. Goldthwait, Troy, N. Y.

303,388. ELEVATOR SAFETY-GATE.—Adam L. Heck, Indianapolis, Ind.

303,409. SELF-CLOSING HATCHWAY. — James G. Wilson, New York, N. Y., and Walter A. Holbrook, Milwaukee, Wis.

303,410. REAMER.—John C. W. Wilson, East Portland, Oreg.

303,414. SASH-FASTENER,—John Y. Bassell, Cincinnati, O.

303,423. WELL-TUBING.—Joseph M. Duncan, and Eben O. McNair, Warsaw, N. Y.

303,426. FIRE-ESCAPE. — Eli Frazier, North Lawrence, Kans.

303,430. SEWER-TRAP. — John W. Griffin, Buffalo, N. Y.

303,435. DOOR-KNOB. — Edwin Alfred Johnson, Allegheny City, Pa.

303,438. FIRE-PROOF HANGING CEILING. — Louis Lafond, New York, N. Y.

303,451. SHUTTER-FASTENER.—Patrick K. O'Lally, Boston, Mass.

303,467. FASTENER FOR KNOB-SPINDLES. — Le Grand Terry, Horseheads, N. Y.

303,468. COMBINED BURGLAR-ALARM AND DOOR-BELL.—Eugene B. Travis, Peekskill, N. Y.

303,478. TOOL-HANDLE. — Granville W. Wright, New Haven, Conn.

303,498. LOCK. — Bernard Deming, Cleveland, O.

303,506. PROCESS OF AND DEVICE FOR THE CONSTRUCTION AND REPAIR OF TUNNELS AND SHAFTS. — John C. Goodridge, Jr., New York, N. Y.

303,566. PORTABLE STEAM-GENERATOR.—John A. Forbes, Dover, Del.

303,568. COMPOSITION FOR PAVING, ROOFING, ETC. — Henry W. Gould, St. Louis, Mo.

303,591. LIGHTNING-ROD. — Geo. S. Prescott, Merrimac, Mass.

303,592. WINDOW. — John H. Press, Olney, Ill.

303,594. BUSH-HAMMER. — John Schwarzmann, Washington, D. C.

303,599. WATER-CLOSET. — George E. Waring, Jr., Newport, R. I.

SUMMARY OF THE WEEK.

Baltimore.

COTTAGE. — W. Claude Frederic, architect, has just completed plans for a frame cottage for L. H. Robinson, Esq., to be built on Beach Ave., Highland Park, to cost, $5,000.

STORE AND DWELLING. — Henry M. Tiralla, Esq., is to have erected a four-st'y store and dwell., 221 North Gay St., of enamelled brick and terra-cotta, 17′ x 75′, to cost about $6,430; from designs by W. Claude Frederic, architect.

STORE AND OFFICE-BUILDING. — Messrs. Wyatt & Sperry, architects, have prepared plans for J. G. Valiant, Esq., for a three-st'y brick building, with stone finish, 30′ x 70′, on Madison Ave., near Orchard St., day's work; Henry Smith & Sons, contractors.

BUILDING PERMITS. — Since our last report thirty permits have been granted, the more important of which are the following: —

Mary R. Scott, 2 three-st'y brick buildings, w s Fulton St., n of Patterson Ave.

P. J. King, 5 three-st'y brick buildings, w s Canton Ave., com. s w cor. Hudson St.

Wm. Carback, 2 two-st'y brick buildings (square), w s Chappell St., bet. Eager and Chew Sts.

D. L. Bangert, 2 three-st'y brick buildings, s s Chew St., w of Broadway.

J. B. Irvine, 8 three-st'y brick buildings, com. n e cor. Mount and Franklin Sts., ft. n e s Mount St, and 2 three-st'y brick buildings, w s Vincent Alley, in rear.

W. B. Turner & Son, 11 three-st'y brick buildings, s s Mulberry St., bet. Mount St. and Vincent Alley.

Binion & Andoun, 3 two-st'y brick buildings, w s Choptank St., n of Pratt St.

J. S. Smuck, 8 two-st'y brick buildings, n s Irvin St., bet. Pratt St. and Norris Alley.

Dr. W. A. Moale, three-st'y brick buildings, w s Charles St., n of Chase St.

Henry M. Tiralla, three-st'y and mansard brick buildings, e s Gay St., bet. Forrest and East St.

Boston.

BUILDING PERMITS. — *Brick.—State St.*, cor. Change Ave., Ward 6, for Mass. Hospital Life Ins. Co., office-building, 27′ 10″ and 68′ 9″ x 138′, eight-st'y flat; T. J. Whidden & Co., builders.

Cedar St., No. 165, rear, Ward 21, for H. J. Pfaff, boiler-house, 30′ x 46′, one-st'y flat; E. B. Studley, builder.

Dale St., Nos. 14 *and* 16, cor. Shedman St., Nos. 20 and 22, Ward 21, for Philip Carrahar, dwell. and store, 33′ x 60′, three-st'y flat; John Potton, builder.

Rockland St., No. 11, cor. Rockland Pl., Ward 21, for F. W. Watkins, 2 dwells., 16′ x 18′ and 22′ 6′ x 35′, three-st'y pitch; Dewing & McClure, builders.

Shawmut Ave., Nos. 10-16, Ward 12, for J. H. Dwyer, dwell. and store, 50′ and 65′ x 67′, two-st'y flat.

Albany St., cor. Bristol St., Ward 16, for City of Boston, repair-shop, 70′ x 100′, three-st'y flat; Gouch & Pray, builders.

Wood. — Blue Hill Ave., Ward 20, for R. S. McIntosh, dwell., 23′ and 32′ x 50′, three-st'y pitch.

East Sixth St., rear, near G St., Ward 14, for Joaquin H. Souther, stable, 24′ x 40′, one-st'y mansard; D. A. Berry, builder.

Mercer St., rear, near East Eighth St., Ward 15, for Sarah Barry, stable, 30′ x 30′, two-st'y pitch; Lyman Locke, builder.

Vaughan Ave., off Geneva Ave., Ward 24, for Joseph Sullivan, dwell., 22′ x 30′, two-st'y pitch.

Dorchester Ave., opposite Charles St., Ward 24, for Elizabeth C. Felker, dwell., 23′ and 29′ x 42′, two-st'y pitch; Edw. Merrill, Jr., builder.

Cambridge St., near Western Ave., Ward 25, for Forrest Hall, dwell., 23′ and 33′ x 35′, two-st'y pitch; Pierce Quirk, builder.

Market St., cor. Lincoln St., Ward 25, for F. M. Roddy, 2 dwells. and stores, 37′ x 34′ and 41′, and 22′ and 26′ x 41′, three-st'y flat; Jos. McCormick, builder.

Maverick St., No. 191, Ward 2, for F. L. Smith, bottling-building, 30′ x 50′, two-st'y flat; A. & J. McLaren, builders.

Champney St., No. 58, Ward 15, for James Harding, dwell., 18′ x 30′, two-st'y flat.

Enfield St., Ward 23, for W. J. Stokes, mechanical, 20′ x 40′, one-st'y pitch; W. J. Stokes, builder.

Greenwich St., near Fenton Pl., Ward 24, for Michael Birmingham, dwell., 24′ x 34′ 8″, two-st'y pitch; F. C. Reid, builder.

Highland St., rear of, Ward 25, for Alex. Glover, dwell., 25′ x 43′, two-st'y pitch; Arthur H. Pierce, builder.

Temple St., near Ivory St., Ward 23, for Mrs. Emeline Osgood, dwell., 26′ x 28′, two-st'y pitch; N. F. Morrison, builder.

Bodwell St., near Bird St., Ward 20, for Franklin King, dwell., 29′ x 34′, two-st'y pitch; Edward McKechnie, builder.

Dove St., No. 8, Ward 20, for Wm. Mulhearn, wagon-shed, 20′ x 22′, one-st'y flat; —— Gabel.

Clifton St., near Cottage St., Ward 20, for A. C. Case, 2 dwells., 16′ x 21′ 6″, two-st'y pitch; A. McDonald, builder.

H St., between Eighth and Ninth Sts., Ward 14, for Wm. H. Hart, stable, 30′ x 46′, two-st'y flat; Holbrook & Harlow, builders.

Washington St., near La Grange St., Ward 23, for Lawrence McQueeney, dwell., 20′ x 28′, two-st'y pitch; R. J. Wild, builder.

Middle St., No. 42, Ward 15, for John Foster, dwell., 22′ x 34′, two-st'y flat; C. E. Snow, builder.

River St., rear, near Cedar St., Ward 24, for John Mooney, greenhouse, 10′ x 70′, one-st'y pitch; John Mooney, builder.

Wheatland Ave., rear, near Washington St., Ward 24, for John Galvin, builder and owner, greenhouse, 12′ x 100′, one-st'y pitch; John Galvin, builder.

Farrington St., near Oak St., Ward 23, for Otis H. Weal, dwell., 22′ x 30′, one-st'y pitch; Alfred Johnson, builder.

East Second St., cor. Q St., Ward 14, for South Boston R. R. Co., storage, 75′ x 150′, two-st'y flat.

Brooklyn.

BUILDING PERMITS.—*Hewes St.*, s s, 100′ w Broadway, two-st'y brick factory, gravel roof, brick cornice; cost, $6,000; owner, H. B. Scholes, 111 Bedford Ave.; architect, E. G. Gaylor; builder, Jas. Haughian.

Fifty-second St., n s, 100′ 6″ e Third Ave., two-st'y frame dwell. (brick filled) tin roof; cost, $3,000; owner, Mrs. G. L. Martin, Forty-third St., near Third Ave.; architect, F. Ryan; builder, D. Ryan.

Greene Ave., s s, 200′ w Marcy Ave., 5 two-st'y brick dwell., tin roofs, wooden cornices; cost, each, $4,500; owner, E. W. Phillips, 543 Greene Ave.; architect and builder, D. Weild.

Devoe St., No. 322, s s, 25′ w Catharine St., three-st'y frame tenement (brick filled) tin roof; cost, $3,800; owner, Peter Beilman, on premises; architect, Th. Engelhardt; builders, C. Dahnken and J. Schneider.

Lawton St., s s, 200′ w Bushwick Ave., 3 three-st'y frame (brick filled) tenements, tin roofs; cost, $3,300 each, owner, Henry Mills, 14 Jefferson St.; architect, John Platte; builder, Henry Loeffler.

Park Ave., s s, 240′ e Nostrand Ave., three-st'y frame (brick filled) store and tenement, tin roof; cost, $3,600; owner, Henry Diemer, 36 Hopkins St.; architect, John Platte.

McDougal St., n s, 175′ w Howard Ave., three-st'y frame tenement (brick filled) tin roof; cost, $3,500; owner, Adolph C. Wenzel, 345 Navy St.; architect, A. V. Porter; builder, E. Porter.

Park Ave., n w cor. Throop Ave., three-st'y frame store and tenement, tin roof; cost, $4,800; owner, Charles Goets, cor. Park and Throop Aves.; architect, H. Vollweiler.

Tompkins Ave., No. 78, three-st'y frame store and tenement; cost, $4,000; owner, W. F. Rappold, Tompkins Ave., near Ellery St.; architect, H. Vollweiler.

Broadway, w s, 114′ s McDougal St., 2 three-st'y frame (brick filled) tenements, tin roofs; cost, $3,300; owner, Bryan Fagan, cor. Broadway and McDougal St.; architect, H. Vollweiler.

Manhattan Ave., n e cor. Norman Ave., 4 four-st'y brick stores and tenements, slate and gravel roofs; cost, each, $6,000; owners, architects, etc., Randell & Miller, 497 Fourth St.; masons, J. & J. Van Riper.

Gates Ave., No. 916, s s, 20′ w Patchen Ave., three-st'y brick store and tenement, gravel roof; cost, $5,000; owner and builder, J. P. Mullen, cor. Sumner and Gates Ave.; architect, J. G. Glover.

Washington Ave., e s, 125′ n Gates Ave., three-st'y brick dwell., tin roof; cost, $11,000; owner, F. J. Randall, 8 Cambridge Pl.; architect, A. Hill; builder, D. H. Fowler.

Union St., s s, 248′ e Seventh Ave., 4 three-st'y brown-stone dwells., tin roofs; cost, each, $11,000; owner, E. B. Sturges, 135 De Kalb Ave.

Lafayette Pl., s s, 140′ w Bushwick Ave., two-st'y frame dwell., tin roof; cost, $4,000; owner, S. A. Snyder, 933 Greene Ave.; architect, I. D. Reynolds; builder, J. Lambert, and J. J. Quinn.

Whipple St., s s, 150′ e Throop Ave., four-st'y brick tin factory; cost, $12,000; owner, M. C. Chambers; architect, J. Platte.

Macon St., s s, abt. 325′ e Lewis Ave., 2 two-st'y brick dwells., tin roofs; cost, each, $4,000; owner and builder, J. A. White, 435 Gates Ave.; architect, Amzi Hill.

Seventh St., s s, 151′ 4″ w Fifth Ave., two-st'y brick dwell., tin roof, wooden cornice; cost, $6,000; owner, Edward Sloggart, 12 Garfield Pl.; architect, Stanley S. Covert; builders, Perkins & Green.

Eighth Ave., n w. cor. Seventeenth St., 10 (8 on ave. and 2 on st.) two-st'y brick dwells., tin roofs; cost, each, abt. $3,000; owner, architect, and carpenter, Jas. H. Darrow, 30 Braxton St.; mason, not selected.

Fulton St., s w cor. New York Ave., four-st'y brick store and flats, tin roof; cost, $12,000; owner, Mrs. Julia Diefendorf; architect, George P. Chappell; builders, Cornelius King, and Morris & Selover.

St. Marks Ave., s e cor. Albany Ave., four-st'y brick orphan asylum, slate roof; cost, $55,000; owners, R. C. Orphan Asylum Soc., on premises; architect, Wm. Schickel; builders, Carlin & Son, and Morris & Selover.

Cheever Pl., Nos. 30, 32, *and* 34, 2 four-st'y brick flats, gravel roofs, wooden cornices; cost, each, $24,000; owner, Thomas Moran, 157 Columbia St.; architect, M. J. Morrill; builders, P. J. Carlin, and Long & Barnes.

ALTERATIONS. — *Java St.*, s s, 200′ w Union Ave., three-st'y brick extension, tin roof; cost, $12,000; owner, Board of Education; architect, J. W. Naughton; builder, James Rooney.

Leonard St., e s, 25′ s Scholes St., add one st'y; also, three-st'y frame extension, tin roof; cost, $4,000; owner, Mrs. J. Baumgartner; architect, John Platte; builders, John Auer, and John Rueger.

Chicago.

BUILDING PERMITS. — E. Morehn, two-st'y dwell., 270 Dayton St.; cost, $2,500.

P. Cosgrove, two-st'y dwell., 79 Miller St.; cost, $2,500.

E. W. Murphy, two-st'y dwell., 316 Loomis St.; cost, $4,000; architect, Ruehl.

Thos. Moran, 3 three-st'y flats, 3453-59 State St.; cost, $60,000; architect, W. W. Boyington; builder, E. F. Gobel.

G. Brand, two-st'y dwell., 655 Superior St.; cost, $3,200.

W. Gallagher, two-st'y flats, 17 Walnut St.; cost, $4,000.

W. Hafiner, two-st'y dwell., 195 Hoyne Ave.; cost, $4,000.

D. Mullaney, three-st'y flats, 1466 Indiana Ave.; cost, $4,500.

R. W. Crumb, two-st'y flats, 750-752 Van Buren St.; cost, $4,000.

Mrs. E. Benton, two-st'y dwell., Twenty-second St.; cost, $2,800.

Mrs. C. Ring, two-st'y flats, 448 Belden Ave., cost, $5,500; architect, L. G. Halberg.

J. L. Campbell, 5 two-st'y dwells., 95-105 De Kalb St.; cost, $23,000; architects, Edbrooke & Burnham.

A. H. Troyke, two-st'y dwell., 1150 North Oakley St.; cost, $2,500.

W. W. Niemann, two-st'y dwell., 120 Larrabee St.; cost, $6,000.

C. F. Wolff, two-st'y dwell.; cost, $3,500.

Geo. Edwards, two-st'y dwell., 404 Maxwell St.; cost, $11,000.

H. Biroth, 5 three st'y stores and dwells., 3807-15 State St.; cost, $35,000; architect, J. C. Doerr.

Saehn Bros., two-st'y dwell., 523 Hurlbut St.; cost, $6,000; architect, C. H. Gottig.

F. Echebrecht, two-st'y dwell., 166 Willow St.; cost, $3,600; architect, F. Thompson.

J. C. McGrath, 2 two-st'y dwells., 3654-56 Dearborn St.; cost, $5,000.

Mrs. L. E. Merrian, two-st'y dwell., 794 Washington Boulevard; cost, $6,000; architect, L. V. Shipman; builder, N. Cameron.

D. & J. Hardin, three-st'y store and dwell., 217 Thirty-first St.; cost, $7,000; architect, G. H. Edbrooke.

J. Shaw, 3 two-st'y dwells., 396-400 Congress St.; cost, $10,000; architect, S. M. Randolph.

W. D. Messinger, two-st'y dwell., 548 Jackson St.; cost, $7,000; architect, Albert Smith.

L. Coyne, dwell., 38 Moore St.; cost, $2,500.

A. A. Sprague, barn, 2708 Prairie Ave.; cost, $4,000.

E. Roos, two-st'y flats, 534 Ashland Ave.; cost, $5,000; architect, A. Bessler; builders, Kreig & Dermuth.

J. Stein, two-st'y dwell., 583 Dixon St.; cost, $2,500.
A. Senger, two-st'y dwell., 683 Dixon St.; cost, $2,500.
J. Szumansky, two-st'y dwell., 685 Dixon St.; cost, $2,500.
J. Senger, two-st'y dwell., 687 Dixon St.; cost, $2,500.
G. T. Stoneham, three-st'y store and flats, 388 Ogden Ave ; cost, $6,350.
N. B. Rappley, two-st'y warehouse, 16 Fourth Ave.; cost, $8,000.
M. McMahon, two-st'y store and dwell., 3157 Archer Ave.; cost, $3,700; builder, O. S. Kelso.

Cincinnati.

STORE. — Morris White, Esq., is to build a four-st'y brick store on Court St., near Vine St.; Samuel Hannaford, architect.

BUILDING PERMITS.—Jerry Delaney, three-st'y frame dwell., cor. McMillian and Forest Aves.; cost, $2,500.
F. Otte, three-st'y brick dwell., Poplar St. and Western Ave.; cost, $5,000.
Church, cor. of Ashler and Freeman Sts.; cost, $23,000.
Andrew Heff, two-st'y brick dwell., cor. Mohawk and Vernon Sts.; cost, $2,000.
Church of the Advent, addition, Hemper Lane and Curtis Sts.; cost, $7,000.
C. E. Iliff, five-st'y brick dwell., cor. Fifth and John Sts.; cost, $10,000.
Mrs. Wampock, two-st'y brick dwell., cor. Barton and Wade Sts.; cost, $4,000.
Louis Denning, three-st'y brick, 186 Bank St.; cost, $3,000.
M. Warth, three-and-one-half-st'y brick dwell., cor. Rittenhaus and Court Sts.; cost, $5,000.
John Schooth, two-st'y brick dwell., cor. James St. and Fifth Ave.; cost, $6,000.
H. W. Hopp, two st'y brick dwell., cor. Bogen and Harrison Ave.; cost, $2,400.
Mrs. Von Lemden, two-and-one-half-st'y brick dwell., 151 Bank St.; cost, $2,000.
David Hummel, two-and-one-half-st'y brick dwell., cor. Straight and Addison Sts.; cost, $7,000.
Aron Nathan, four-st'y brick dwell., 333 West Sixth St.; cost, $5,000.
R. S. Woddell, two-st'y frame dwell., Columbia St.; cost, $2,000.
John Holscher, three-st'y brick dwell., cor. Werner and Ravine Sts.; cost, $2,600.
Henry Heusing, two-st'y brick dwell., cor. Findley St. and Western Ave.; cost, $6,000.
J. B. Campbell, three-st'y brick dwell., 108 Western Ave.; cost, $3,000.
Christ Westfall, three-st'y brick dwell., 88 Gilbert Ave.; cost, $4,000.
John Ware, two-and-one-half-st'y brick dwell., cor. Purcel and Warsaw Pike; cost, $4,000.
Paul Gratzy, three-st'y brick dwell., 94 Buckeye St.; cost, $3,500.
J. R. Powell, two-st'y frame dwell., cor. Front and Collard Sts.; cost, $2,600.
Henry Bresser, three-st'y brick dwell., cor. Woodward and Hunt Sts.; cost, $4,000.
Mrs. Schwartzott, two-and-one-half-st'y brick dwell., Wheeler St., near Calhoun St.; cost, $3,500.
Geo. Opitz, two-st'y brick dwell., cor. Clifton and Cliff Aves.; cost, $4,000.
Geo. Geizer, three-st'y brick dwell., cor. McMicken and Dunlap Sts.; cost, $4,000.
Schmit Bros., one-st'y brick dwell., 44 McMicken St.; cost, $6,000.
Geo. Buirk, three-st'y brick dwell., cor. Coleman and Bank Sts.; cost, $3,000.
A. C. Williams, two-st'y brick dwell., cor. Beek and Locust Sts.; cost, $2,600.
Cost, $138,700.
Repairs, $16,030.
Total, 154,730.
Total number permits to date, 572.
Total cost to date, $2,273,555.

Milwaukee, Wis.

BUILDING PERMITS.—Chris. Templin, store for Frank Tœpper, on National Ave., Eighth Ward; cost, $2,500.
F. Piepenhagen, frame dwell., for C. Fanning, on Farwell Ave., First Ward; cost, $3,400.
C. Schuckneeb, frame dwell., for M Sweet, Farwell Ave., First Ward; cost, $6,000.
C. Templemann, church, cor. Brown and Fond du Lac Aves., Ninth Ward; cost, $5,000.

Minneapolis, Minn.

BUILDING PERMITS. — Baker, Potter & Co., five-st'y brick warehouse, First St., between Fifth and Sixth Aves., North; cost, $15,000.
Baker, Potter & Co., grain elevator, First St., between Fifth and Sixth Aves., North; cost, $75,000.
Miss A. Wetherbee, two-st'y double dwell., n s Fourteenth St., between Third and Fourth Aves., South; cost, $6,000.
J. H. James, two-st'y frame dwell., Nicolet Ave., between Thirty-first and Thirty-second Sts.; cost, $3,800.
John Graber, two-st'y brick veneered store and dwell., cor. Tenth Ave. and Sixth St.; cost, $3,000.
Roberts & Lenhart, brick carriage-shop, n s of Main St., between Central Ave. and First Ave., North; cost, $4,000.
Holy Rosary School Society, three-st'y brick school-house, Sixth St., between Cedar and Nineteenth Aves., South; cost, $20,000.
J. D. Hutchins, two-st'y wooden dwell. and barn, e s Third Ave., South, between Twenty-first and Twenty-second Sts.; cost, $6,450.
P. G. Lamoreaux, two-st'y wooden dwell., First Ave., South, between Thirty-second and Thirty-third Sts.; cost, $5,000.
E. P. Sweet, two-st'y wooden dwell., n w s Hillside Pl.; cost, $5,000.
Gen. L. A. Grant, two-st'y frame dwell., 43′ x 56′, Prospect St.; cost, $10,000.

New York.

BUSINESS is duller than it has been for many years, even at this season of the year, when work necessarily drags.

ASYLUM. — An addition, 62′ 6″ x 80′, is to be made to the St. Vincent de Paul Orphan Asylum, on Thirty-ninth St. and Seventh Ave. It will be four stories high, with basement of Philadelphia brick with stone finish. Mr. W. H. Hume is the architect.

BUILDING PERMITS. — *One Hundred and Forty-fourth St.*, s s, 300′ e Eighth Ave., one-and-a-half-st'y frame stable, shingle roof; cost, $2,500; owner, Michael H. Cashman, 308 Fifth Ave.; architect, A. Spence.
One Hundred and Forty-third St., s s, 175 e Willis Ave., 4 three-st'y frame dwells., tin roofs; cost, each, $3,000; owners, Thomas Phillips, One Hundred and Forty-first St., near Brook Ave., Edward Harvey, 139 East Fifty-third St., Chas. Miller, 209 East Fifty-fourth St., and Robert Letoche, 349 East Seventieth St.; architect, C. Miller; carpenter, M. Munch.
Washington Ave., No. 1242, e s, 175′ n One Hundred and Sixty-eighth St., three-st'y frame dwell., slate and tin roof; cost, $4,000; owner, Samuel E. Tyler, One Hundred and Forty-third St., near Third Ave.; architect, H. S. Baker; carpenter, B. F. Frisbie.
One Hundred and Forty-third St., s s, 100′ e Sixth Ave., 2 four-st'y brick and Belleville stone dwells., slate and tin roofs; cost, $7,500; owner, Jos. Thompson, 56 West Fifty-second St.; architect, J. E. Terhune.
Second St., No. 246, five-st'y brick tenement, tin roof; cost, $9,000; owner, Michael Fay, 417 East Twentieth St.; architects, A. B. Ogden & Son.
One Hundred and Fifty-third St., s s, 295′ 3″ e Morris Ave., three-st'y frame tenement, tin roof; cost, $4,800; owner, Christopher Eder, 532 East One Hundred and Fifty-third St.; architect, E. Stichler.
Hudson St., n w cor. Harrison St., five-st'y brick and stone building, copper and slate roof; cost, $175,000; owner, The New York Mercantile Exchange, Wm. H. Duckworth, chairman building committee, 322 West Nineteenth St.; architect, Thomas R. Jackson; builder, S. Lowden.
West Seventy-third St., No. 428, four-st'y brick and stone dwell., tin and slate roof; cost, $30,000; owner, Henry W. Struss, 335 West Fifteenth St.; architect, W. Wheeler Smith.
East One Hundred and Twenty-sixth St., No. 227, five-st'y brick tenement, tin roof; cost, $12,000; owner, I. E. Wright, 1983 Broadway; architects, Cleverdon & Putzel.
Second Ave., w s, 75′ n s Sixty-fourth St., two-st'y brick workshop and stable, gravel roof; cost, $3,000; lessee and builder, John J. Brierly, 113 East Forty-eighth St.; architect, John J. Friend.
One Hundred and Sixty-seventh St., n s, 200′ w Tenth Ave., 3 two-st'y frame dwells., tin roofs; cost, each, $1,600; owner, Martin Bauer, 55 Pitt St., builders, R. Terwilliger and Geo. Sauter.
One Hundred and Twenty-second St., n s, 72′ e Eighth Ave., 2 three-st'y brown-stone front dwells., tin roofs; cost, each, $9,000; owner, Lorenz Weiher, New Rochelle; architect, J. F. Burrows.
One Hundred and Fourth St., s s, 100′ w Tenth Ave., 2 five-st'y brown-stone front flats, tin roofs; cost, total, $37,000; owner, Wm. Curry, 329 West Fourteenth St.; architect, M. Louis Ungrich.
Twenty-sixth St., s s, 75′ e First Ave., five-st'y brick laboratory, tin roof; cost, $50,000; owner, Frederick S. Dennis, M. D., 21 East Twenty-first St.; builder, Jos. Richardson.
First Ave., n e cor. Thirty-second St., 6 five-st'y brick tenements and stores, tin roofs; cost, each, $18,000; owner, Leopold Kaufmann, 129 East Sixtieth St.; architects, Schwarzmann & Buchmann.
First Ave., s e cor. Thirty-third St., six-st'y brick factory, tin roof; cost, $70,000; owner and architects same as last.
Thirty-third St., s s, 125′ e First Ave., five-st'y brick tenement, tin roof; cost, $18,000; owner and architects, same as last.
Second Ave., w s, 22′ 10″ s One Hundred and Fifth St., five-st'y brown-stone front tenement and store, tin roof; cost, $10,000; owner, Mrs. Theresa Schappert, 503 East Eighty-eighth St.; architect, John C. Burne; builder, John A. Schappert.
Second Ave., w s, 48′ 11″ s One Hundred and Fifth St., 2 five-st'y brown-stone tenements and stores, tin roofs; cost, $10,000; owner, architect, and builder, same as last.
Ninetieth St., s s, 100′ e Third Ave., 5 five-st'y brick and stone flats, tin roofs; cost, each, $20,000; owner, Michael Giblin, 125 East Ninety-second St.; architects, Babcock & McAvoy.

Philadelphia.

BUILDING PERMITS. — *Norris St.*, s of Fifteenth St., 3 three-st'y dwells., 16′ x 56′; A. Miller, contractor.
Norris St., s of Fifteenth St., store and dwells., 35′ x 45′; A. Miller, contractor.
Jefferson St., w of Ridge Ave., two-st'y dwell., 17′ x 45′; A. P. Righter, owner.
Sherre St., No. 506, two-st'y dwell., 15′ x 30′; Jno. G. Long, owner.
East Thompson St., No. 633, three-st'y dwell., 17′ x 52′; J. S. Baldt & Son, contractors.
Seventh St., cor. Marriott St., two-st'y warehouse, 32′ x 57′; Thos. McManemy.
North Fortieth St., No. 51, three-st'y dwell., 18′ x 58′; T. C. Sloan, owner.
Bowman St., e of Thirty-fifth St., 4 two-st'y dwells., 14′ x 32′; Wm. Kindon, owner.
Germantown Ave., No. 4765, three-st'y dwell., 13′ x 30′; A. Reiber, owner.
Fifth St., n of Butler St., 2 two-st'y dwells., 15′ x 44′; Anthony Weise, owner.
Sansom St., No. 834, stationary engine-house, C. R. R., 105′ x 107′; Philadelphia Traction Co., owner.
Thirty-fourth St., cor. Huntingdon St., two-st'y dwell., 18′ x 47′; Chas. Bartle, contractor.
New St., between Thirty-fourth and Thirty-fifth Sts., two-st'y dwell., 15′ x 32′; Chas. Bartle, contractor.
Cedar St., n of Terrace St., 2 two st'y dwells., 16′ x 32′; Jas. Harper, contractor.
Jefferson St., n of Hamilton St., two-st'y dwell., 16′ x 42′; Harry Rowland, owner.
Manayunk Ave., s of Penn St., two-st'y dwell., 18′ x 45′; Wm. Eddlemar, contractor.
Columbia Ave., No. 1304, three-st'y drying-room, 20′ x 40′; F. Koening.
Williams St., Nos. 510–518, 5 two-st'y dwells., 14′ x 40′; Christian Dear, contractor.
Edmund St., e of Margaretta St., two-st'y dwell., 16′ x 35′; Thomas Waters, contractor.
High St., bet. Morton and Chew Sts., 6 three-st'y dwells., 18′ x 53′; D. S. McNabb, contractor.
Fifth St., n of York St., 3 three-st'y dwells., 16′ x 40′; F. Striebig, contractor.
Howard St., No. 1515, three-st'y dwell., 18′ x 50′; S. R. Stewart, contractor.
Ridge Ave., No. 3707, two-st'y store and dwell., 16′ x 50′; J. N. Esher, contractor.
Wyoming St., w of New Second St., two-st'y stable, 18′ x 40′; Jno. Davis, Jr.

St. Louis.

BUILDING PERMITS. —Eighty-eight permits have been issued since our last report, seventeen of which are for unimportant frame houses. Those worth $2,500 and over are as follows: —
E. P. Dickson, 2 adjacent two-st'y dwells.; cost, $3,000; E. P. Dickson, contractor.
Domino Signiago, two-st'y brick dwell.; cost, $7,000; P. F. Magher & Son, architects; sub-let.
Hugh L. White, two-st'y brick dwell.; cost, $10,000; Isaacs, architect.
Jno. Ritter, two-st'y dwell.; cost, $4,000; Wm. C. Shaper, architect; H. Heitmann, contractor.
J. W. Mueller, two-st'y dwell.; cost, $4,000; Wm. Gahl, contractor.
Jos. Baumgarten, two-st'y dwell.; cost, $4,000; Wm. Gahl, contractor.
Mathias Obrecht, 3 adjacent two-st'y tenements; cost, $5,900; A. Dietz, contractor.
Nicholson Bros., two-st'y dwell.; cost, $3,200; Hunt, architect; H. Redmond, contractor.
Presbyterian Church Co., two-st'y dwell.; cost, $3,600; J. Smiley, contractor.
Wm. Maschmidt, two-st'y dwell.; cost, $4,000; L. Jueger, contractor.

St. Paul, Minn.

BUILDING PERMITS. —John Jessrang, two-st'y brick veneered store and dwell., w s of Rice St., between Inglehart and Tilton Sts.; cost, $3,000.
Monroe Sheire, one-and-one-half-st'y frame double dwell., on the e s of Benny St., between Lee and Tuscarora Sts.; cost, $2,300.
Albert Spangenberg, two-st'y brick-veneered dwell., e s of Fort St., between Ninth and Rice Sts.; cost, $3,000.
Charles Horst, three-st'y brick store and dwell., s s of Tenth St., between St. Peter and Fort Sts.; cost, $10,000.
St. Paul Union Depot Company, two-st'y brick warehouse, facing side of depot grounds, between Rosabel and Wacouta Sts.; cost, $20,000.
I. N. Snow, two-st'y brick block of three dwells., s s of Pleasant Ave., between Third and Sixth Sts.; cost, $8,000.
D. R. Noyes, two-st'y stone residence, s s of Summit Ave., between Virginia and Western Aves.; cost, $20,000.
Union Depot Company, rebuilding union depot, e s of Sibley St., between Third St. and Railway; cost, $75,000.
Frederick Driscoll, two-st'y brick dwell., s s of Summit Ave., between Walnut and Western Aves.; cost, $10,000.
Board of Education, two-st'y brick addition to the Adams school-house, w s of Eaton Ave., between Colorado and Wood Ave.; cost, $14,143.
Board of Education, two st'y brick school-house, e s of Agate St., between Cayuga and Granite Sts.; cost, $21,356.
John Schiller, two-st'y brick and brick-veneered double store and dwell., e s of Park Ave., between Viola and Sherburne Sts.; cost, $3,600.

Bids and Contracts.

PENSACOLA, FLA. — The following is an abstract of the bids received for stone-work of basement and superstructure of the custom-house and post-office:—
Gill & Beard, brownstone, total $107,653; estimate for stone-work in dormers and tower, $20,000. Bowling green, total, $97,074; for dormers and tower, $18,135. Bedford, total, $93,250; dormers and tower, $17,693.
A. V. Clubbs, Buena Vista freestone, total, $72,000; for dormers and tower, $13,000.
Belknap & Dumesnil Stone Co., Bowling Green stone, total, $66,950 (*accepted*); dormers and tower, $12,850.
M. A. McGowan, Bowling Green or Buena Vista freestone, total, $89,000; dormers and tower, $16,896. Brown-stone, total, $104,000; tower and dormers, $19,710.
John R. Smith, Connecticut brown-stone, total, $83,950; dormers and towers, $18,000.
The following is a synopsis of the bids received for furnishing bricks, cement, sand, and terra-cotta flue-lining for the same building:—
Figh & Williams, bricks, $12.50; cement, $2.10 per barrel.
B. R. Pitt, bricks, $13.
Gasper Shank, sand, per cubic yard, 95 c.
R. H. Turner, bricks, $13.
M. S. Belknap, bricks, $10.25.
A. V. Clubbs, bricks, $12.40; cement, $1.90; sand, 80 c.; terra-cotta, per lineal foot, 75 c.
J. M. Wheatley, sand, per barrel, $1.93.

KANSAS CITY, MO. — The following is a synopsis of bids for plastering for the custom-house and post-office: —
Smith & Crimp, $4,376 (*accepted*).
Joseph Eastman, $5,732.
David W. Lloyd, $7,200.
Sheppard & Bags, $8,890.
J. S. Lewis, $9,500.
William Harris, $9,875.
Charles R. Field, $15,500.

WASHINGTON, D. C. —In pursuance to advertisement, the following bids have been received for the nine sections of terrace at the Capitol: —
Hallowell Granite Co., $41,700.
Douglass Bros., $37,354.78.
Richard Rothwell, $34,323.
Acker & Co., $32,800.
Edwards & Son, $32,000.
Robert McLeod, $31,801.23.
M. C. Flannery, $30,000.
Lane & Mainati, $28,279 (*accepted*).

Publishers' Department.

The American Architect and Building News.

PUBLISHED EVERY SATURDAY BY

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15 cents per copy; $6.00 per year; six months, $3.50; 12 Monthly Numbers, $1.75.

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New Advertisements.

THE YALE & TOWNE MANUFACTURING CO. (Stamford, Conn.), Locks. Page xx.
GEO. A. OHL & CO. (Newark, N. J.), Copying-Presses. Page xiv.

WANTED.

SITUATION. — Wanted, situation by a draughtsman of many years practical experience, well versed in detail, construction, and perspective. Address, Carlo, care of *American Architect*. 453

PROPOSALS.

BANK BUILDING. [At East Bridgewater, Mass.]

Proposals will be received **until September 1, next**, by the East Bridgewater Savings Bank, for the erection of a brick building, about 35′ x 60′, two-st'y high, to be built in accordance with plans and specifications which can be seen at the treasurer's office. Proposals will be received for the mason-work, carpenter-work, and painting separately, or for the building complete.

K. E. SHELDON,
452 Chairman of Building Committee.

MAIL ELEVATORS. [At New York, N. Y.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., August 14, 1884.

Sealed proposals will be received at this office **until 2 P. M., on the 4th day of September, 1884,** for furnishing and putting in place complete in the post-office and court-house building at New York, N. Y. Four (4) steam elevators in accordance with specification, copies of which, and any additional information may be had on application at this office, or the office of the superintendent of repairs.

Bids must be accompanied by a certified check, and those received after time of opening, will not be considered.

M. E. BELL,
453 Supervising Architect.

SEWER. [At Avondale, O.]

CINCINNATI, August 16, 1884.

Sealed proposals will be received at the office of the undersigned, Room 23, Sinton Building, Fifth and Vine Streets, Cincinnati, O., **until 12 o'clock, M., of Saturday, the 13th day of September, A. D. 1884,** for construction of the main sewer and the necessary appurtenances thereto, in District No. 1, in accordance with plans of District No. 1, of the general sewerage plan of the incorporated village of Avondale, and according to the specifications on file in the office of the Board of Commissioners of Sewers.

The Council reserves the right to reject any or all bids.

Bidders will indorse their names and address upon the outside of the envelopes containing their bids.

Each bid to be accompanied by two disinterested sureties.

Bidders to use the printed forms, as none other will be received.

By order of the Village Council of Avondale.

W. ELLWOOD WYNNE,
453 Corporation Clerk.

PROPOSALS.

BREAKWATER. [At New Haven, Conn.]

ENGINEER OFFICE, U. S. ARMY,
NEW HAVEN, CONN., August 4, 1884.

Sealed proposals for the extension of the New Haven breakwater will be received at this office **until 10 o'clock, A. M., on Monday, September 8, 1884.**

Proposals must be made in triplicate.

Specifications, blank forms, and instructions to bidders may be had on application to this office.

WALTER McFARLAND,
453 Lt.-Col. of Engineers.

BREAKWATER. [At Buffalo, N. Y.]

U. S. ENGINEER OFFICE,
BUFFALO, N. Y., August 14, 1884.

Sealed proposals, in triplicate, will be received at this office **until 11 o'clock, A. M.** (75th meridian time), **on the 13th day of September, 1884,** for the extension of the Buffalo Breakwater.

Specifications, blank forms, and instructions to bidders may be had on application at this office.

EDWARD MAGUIRE,
453 Captain of Engineers, U. S. A.

BRICK, LIME, CEMENT, ETC. [At New York, N. Y.]

NAVY PAY OFFICE, 27 STATE STREET,
NEW YORK, N. Y., August 16, 1884.

Proposals, in duplicate, sealed and endorsed on envelope, "Bid for Supplies Advertised," will be received **at this office until 12 o'clock, August 26, 1884,** for the following supplies of the best quality, to be delivered within ten days from date of order, free of expense, at the Navy Yard, New York: —

BUREAU CONSTRUCTION AND REPAIR.
67,000 hard brick,
128 barrels lime,
64 barrels fire-clay,
68 barrels cement.

Full information in relation to the quality of the articles required can be obtained at the Navy Yard.

The right is reserved to reject any or all bids that may not be deemed advantageous to the Government.

Two responsible sureties required for the prompt and faithful delivery of the supplies awarded.

Blank forms will be furnished at this office.

Bids not properly signed and certified will not be considered.

A. H. GILMAN,
452 Pay Director, U. S. Navy.

POST-OFFICE. [At Winnipeg, Man., B. N. A.]

DEPARTMENT OF PUBLIC WORKS,
OTTAWA, August 9, 1884.

Sealed tenders, addressed to the undersigned and endorsed "Tender for Post-Office, etc., at Winnipeg, Man., will be received at this office **until Tuesday, the 2d September next, inclusively,** for the erection and completion of post-office, etc., at Winnipeg, Man.

Plans and specifications can be seen at the Department of Public Works, Ottawa and at the Dominion Clerk of Works Office, Winnipeg, on and after Monday, the 18th inst.

Persons tendering are notified that tenders will not be considered unless made on the printed forms supplied, and signed with their actual signatures.

Each tender must be accompanied by an accepted bank check, made payable to the order of the Honorable the Minister of Public Works, equal to five per cent of the amount of the tender, which will be forfeited if the party decline to enter into a contract when called upon to do so, or if he fail to complete the work contracted for. If the tender be not accepted the check will be returned.

The Department will not be bound to accept the lowest or any tender.

By order,
F. H. ENNIS,
453 Secretary.

IRON BEAMS. [At Rock Island, Ill.]

ROCK ISLAND ARSENAL, July 26, 1884.

Sealed proposals, to be opened at **10 A. M., August 30, 1884,** are invited to furnish for this arsenal about 500,000 pounds of wrought-iron beams, tees, and angles.

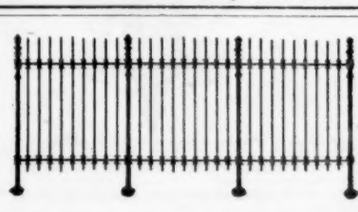
Full bills and specifications can be obtained from the undersigned.

The Government reserves the right to reject all bids not deemed satisfactory.

Bids from manufacturers who have not already made successfully the sizes of beams required will not be considered.

The successful bidder must enter into contract and give satisfactory bonds for the faithful performance of the same.

D. W. FLAGLER,
452 Lieut.-Col. of Ordnance Commanding.



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Architects and visitors interested in building, from all parts of the country, are particularly invited to make this establishment their headquarters. Information and assistance will be extended to them, and use of writing and reading rooms gratis.

Visitors' Correspondence may be addressed in care of this establishment.

HENRY LORD GAY, Proprietor. T. S. HOTCHKISS, Manager.

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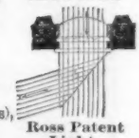

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PROPOSALS.

PIER. [At Calumet Harbor, Ill.]

U. S. ENGINEER OFFICE, 25 HONORE BUILDING,
CHICAGO, ILL., July 24, 1884.

Sealed proposals, in triplicate, will be received at this office **until 12 o'clock, noon, Saturday, August 30, 1884,** for improving Calumet Harbor, Ill., for extension of south pier about 200 linear feet.

For specifications, blanks for proposals, and all information apply at this office.

W. H. H. BENYAURD,
452 Major of Engineers, U. S. A.

STATE CAPITOL. [At Atlanta, Ga.]

New sealed proposals for the Georgia State Capitol Building are invited by the Capitol Commission **until September 24, 4 P. M. 1884.**

Plans, specifications, schedules and instruction to bidders may be had upon application to the Commission, in Atlanta, Ga., or to Edbrooke & Burnham, architects, 184 Dearborn St., Chicago, Ill.

Proposals may be submitted for the entire work, or for any classified portion, also for materials.

The Commission reserves the right to accept any bid, or to reject the whole.

No proposals will be considered unless made out on the schedules blanks.

All bidders will be required to furnish bond and security or a certified check (payable to the Chairman of the Board) equal in amount to five per cent of the bid submitted, as a guarantee to enter into contract with the Board should his bid be accepted.

Bids must be sealed and indorsed "Proposals for State Capitol Building," and addressed to the Board of Capitol Commissioners, Atlanta, Ga.

HENRY McDANIEL, Governor,
456 and Ex-Off. Ch'n Commission.

BREAKWATER AND PIER. [At Milwaukee, Racine and Kenosha, Wis.]

UNITED STATES ENGINEER OFFICE,
366 MILWAUKEE STREET,
MILWAUKEE, WIS., July 29, 1884.

Sealed proposals, in triplicate, will be received at this office **until 12 o'clock, noon, August 29, 1884,** and opened immediately thereafter in presence of bidders for the following harbor improvements, viz.:

Harbor of Refuge, Milwaukee Bay: construction of breakwater.

Racine Harbor: superstructure over 340 feet more or less of north pier and repairs of pier.

Kenosha Harbor: superstructure over 355 feet more or less of south pier and repairs of pier.

Proposals will be accompanied by a guaranty that if the bid be accepted, contract will be entered into within ten days after notice of acceptance.

For blank proposals and information apply at this office.

The United States reserves the right to reject any or all bids.

Proposals will be indorsed on the envelope: "Proposals for Harbor of Refuge, Milwaukee Bay," (or Racine or Kenosha Harbor) and addressed to

CAPTAIN W. L. MARSHALL,
452 Corps of Engineers, U. S. A.

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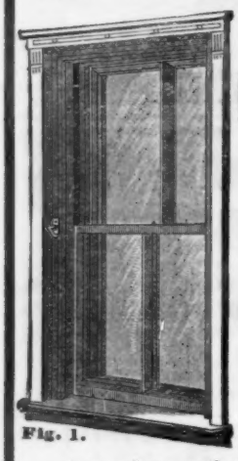

Fig. 1.—Interior view of window, with ATTWELL LOCK applied, the key-head and escutcheon being alone visible.

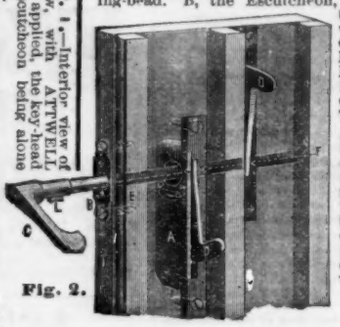

Fig. 2.

Fig 2.—Sectional view of frame at left of meeting-rails of sash, showing Locks A A mortised into frame on right and left of parting-bead. B, the Escutcheon, located over keyhole in reveal of frame. C, the REMOVABLE Key, controlling from the ONE POINT THE TWO LOCKS A A. D D, the Bolts of Locks, one controlling each sash, operated separately, but working in combination. L, a lug on key, used in operating "shut off"—*i. e.*, holding, at pleasure, either bolt out of engagement with "strike."

Fig. 3.

Fig. 3.—Section of sash showing location and application of "strike." This "strike" gives four locking or ventilating points to each sash within a radius of safety from the admission of the thief's body.

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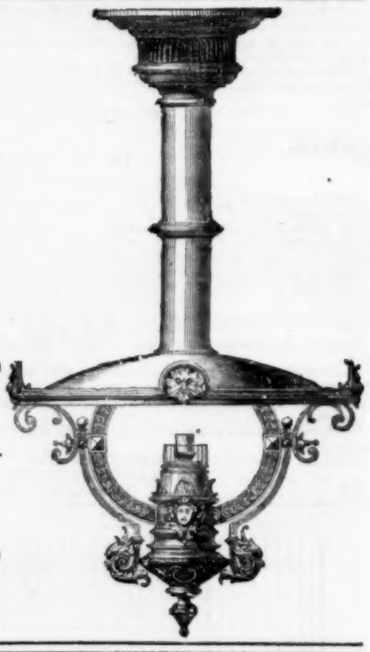

PROPOSALS.

CEMENT, LUMBER, ETC.
[At Rock Island, Ill.]

ROCK ISLAND ARSENAL, July 28, 1884.

Sealed proposals are invited to furnish, delivered on cars or wagons at the arsenal, the lime, hydraulic cement, coke, coal (bituminous, anthracite and blacksmith) and lumber that may be required at this arsenal from date of contract to June 30, 1885.

Bills of the materials with approximate quantities, specifications as to the quality, and other requirements can be obtained from the undersigned.

The successful bidder will be required to enter into contract and give good and sufficient bond for the faithful performance of the same.

Bids for bituminous coal delivered on cars in the city of Rock Island will be considered.

The Government reserves the right to reject any or all bids.

The quantities of material required can be given only approximately, and after contracts are awarded only such materials will be furnished as may be required and are ordered from time to time by the commanding officer of the arsenal.

PROPOSALS.

Proposals should be in triplicate, sealed and indorsed "Proposals for Materials."

Bids will be opened **at 10 A. M., September 2, 1884.**

Bidders are invited to be present at the opening.

D. W. FLAGLER,
452 Lieut.-Col. of Ordnance Commanding.

LABOR AND MATERIALS.
[At Jackson, Tenn.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., August 12, 1884.

Sealed proposals will be received at this office **until 2 P. M., on the 9th day of September, 1884,** for furnishing all the labor and materials, stone, bricks, terra-cotta, wood-joists, roof framing, slate covering, etc., required for the basement and superstructure of the court-house and post-office building at Jackson, Tenn., in accordance with drawings and specification, copies of which and any additional information may be obtained on application at this

PROPOSALS.

office, or the office of the local superintendent of the building.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered.

M. E. BELL,
452 Supervising Architect.

PAINTING, VARNISHING, AND BRONZING.
[At Knoxville, Tenn.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., August 14, 1884.

Sealed proposals will be received at this office **until 2 P. M., on the 4th day of September, 1884,** for all the painting, varnishing and bronzing, required for the custom-house and post-office, at Knoxville, Tenn., in accordance with specification, copies of which and any additional information may be obtained on application at this office or the office of the custodian at the building.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered.

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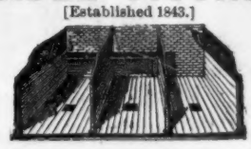

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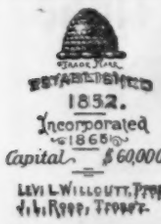

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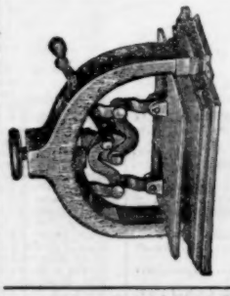

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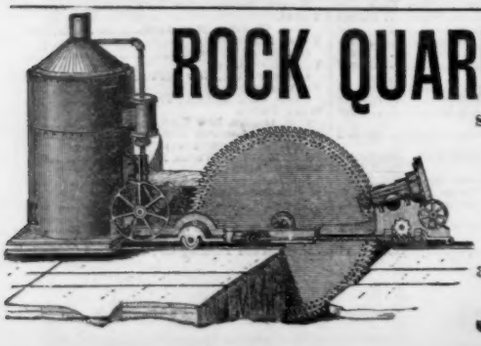

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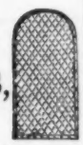

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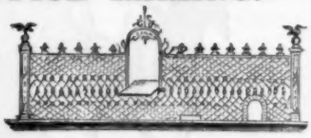

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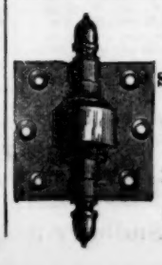

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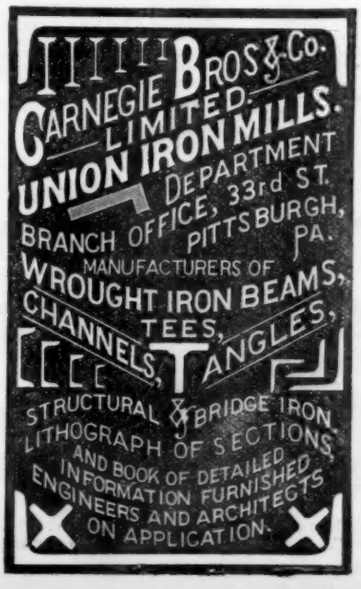

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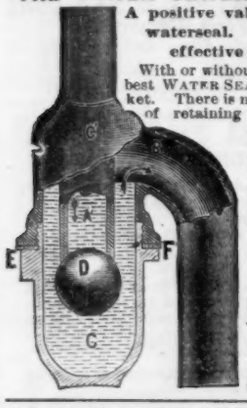

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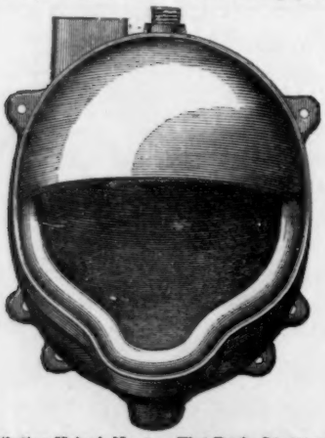

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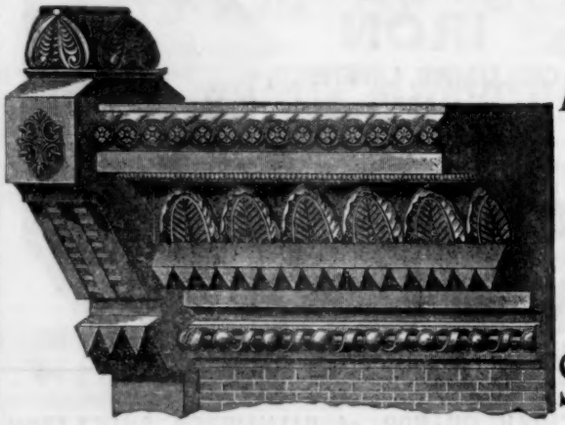

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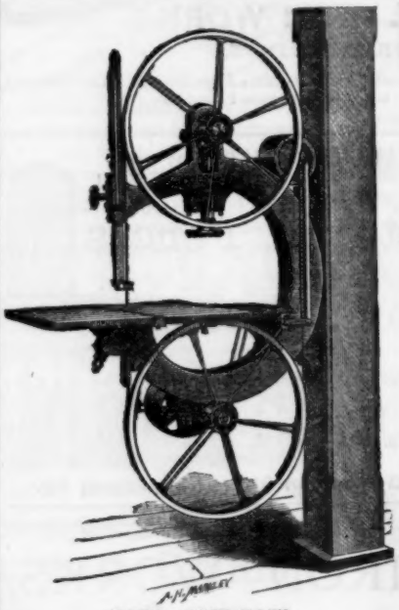

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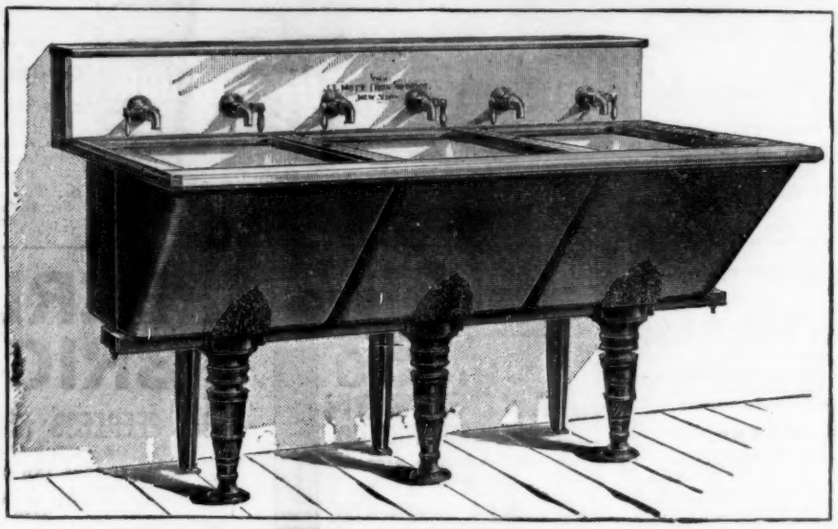

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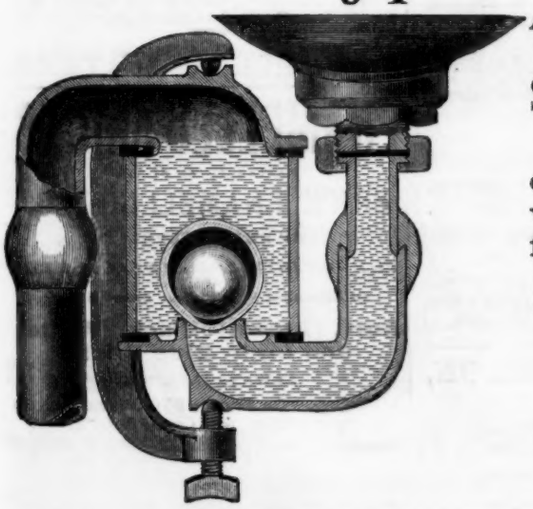

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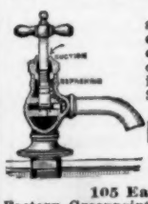

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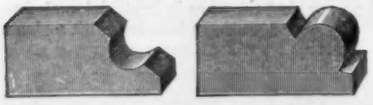

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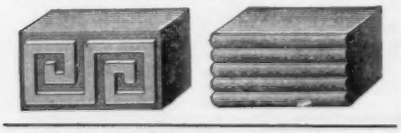

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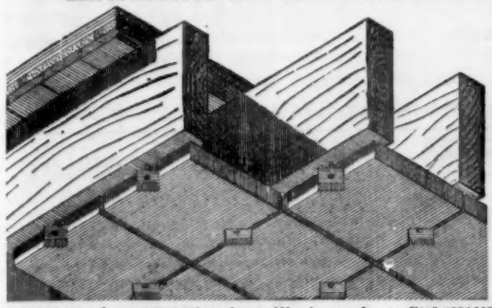

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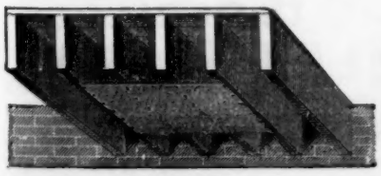

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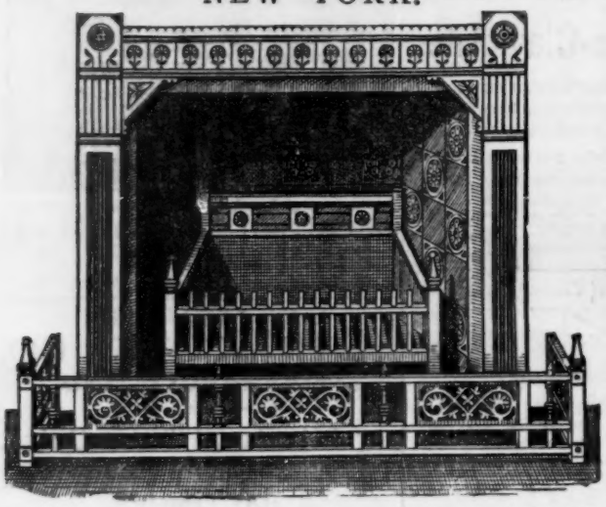

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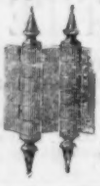

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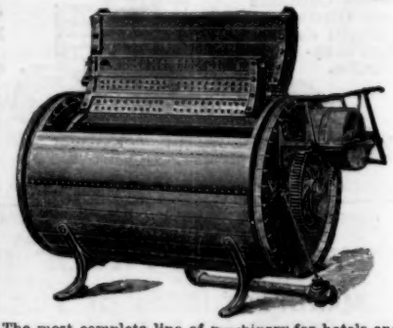

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